

JVC

SERVICE MANUAL

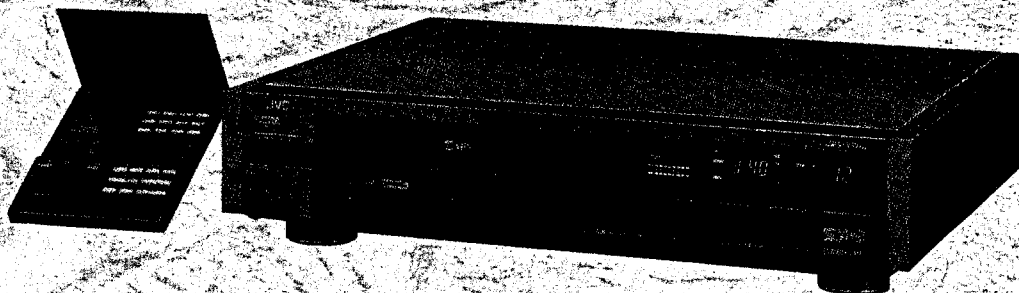
Hi-Fi STEREO VIDEO CASSETTE RECORDER

HR-S8000U

S VHS

DIGITAL

HQ
High Quality



SPECIFICATIONS

Format	: S-VHS/VHS NTSC standard with Hi-Fi audio	Signal-to-noise ratio	: 45 dB (Rohde & Schwarz noise meter) with PICTURE SHARPNESS control at center position
Video recording system	: Rotary, two-head helical scan system with slant double-azimuth combination video heads	Horizontal resolution	: More than 400 lines (S-VHS)/ 240 lines (VHS) with PICTURE SHARPNESS control at center position
Hi-Fi audio recording system	: Deep-layer recording system conforming to stereo Hi-Fi VHS standard	Audio	
No. of audio channels	: 2 Hi-Fi audio channels 1 normal audio channel	Input	: -8 dBs, more than 50 k-ohms unbalanced
Video signal system	: NTSC-type color signal and separated Y/C signals conforming to NTSC	Output level	: -6 dBs, high impedance load
Tape width	: 12.65 mm (1/2 inch)	Output impedance	: Less than 1 k-ohm, unbalanced
Tape speed		Signal-to-noise ratio	: More than 40 dB (Normal audio)
	(SP) : 33.35 mm/s (1-5/16 ips)	Frequency range	: 70 Hz to 10,000 Hz (Normal audio)
	(EP) : 11.12 mm/s (7/16 ips)	Hi-Fi audio	
Maximum recording time		Frequency response	: 20 Hz to 20,000 Hz
	(SP) : 160 min. with T-160 video cassette	Dynamic range	: More than 90 dB
	(EP) : 480 min. with T-160 video cassette	Wow and flutter	: Less than 0.005 % WRMS
Temperature		Timer	: 14-day programmable timer 8 programs with repeat function
Operating	: 5°C to 40°C (41°F to 104°F)	Dimensions	: 467 mm(W) x 107 mm(H) x 373 mm(D) (18-7/16" x 4-1/4" x 14-11/16")
Storage	: -20°C to 60°C (-4°F to 140°F)	Weight	: 8.4 kg (18.6 lbs)
Antenna	: 75 ohms, unbalanced	Provided accessories	: Infrared remote control unit "AA"-size battery x 2 S-VIDEO cable (4-pin) Matching transformer Antenna extension cable Antenna splitter Antenna cable (F-type) Audio cable Video cable S-VHS cassette tape
Channel coverage			
	(VHF) : Channels 2 - 13		
	(UHF) : Channels 14 - 69		
	(CATV) : 113 channels		
RF output signal	: Channel 3 or 4 (switchable; preset to channel 3 when shipped) 75 ohms, unbalanced		
Power requirement	: AC 120 V~, 60 Hz		
Power consumption	: 48 W		
Video			
Input	: 0.5 to 2.0 Vp-p, 75 ohms, unbalanced		
Output	: 1.0 Vp-p, 75 ohms, unbalanced		

Specifications shown are for SP mode unless otherwise specified.
Design and specifications subject to change without notice.

NOTE: For a technical description, please refer to Technical Guide VTG82019 HR-S8000 NTSC.

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Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the  symbol and shaded (■) parts are critical for safety.

Replace only with specified part numbers.

Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.

Caution for continued protection against fire hazard.
Replace only with same type and rated fuse(s) as specified.

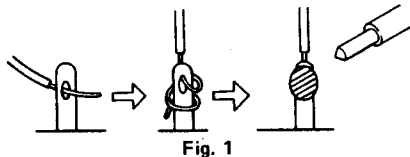
4. Use specified internal wiring. Note especially:

- 1) Wires covered with PVC tubing
- 2) Double insulated wires
- 3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:

- | | | |
|--------------------|--------------------------------------|------------|
| 1) Insulation Tape | 3) Spacers | 5) Barrier |
| 2) PVC tubing | 4) Insulation sheets for transistors | |

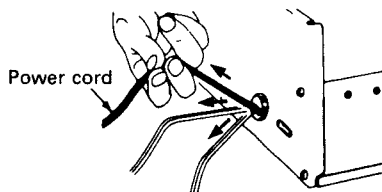
6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.



7. Observe that wires do not contact heat producing parts (heat-sinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10–15 kg of force in any direction will not loosen it.



10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)

In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector

In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.

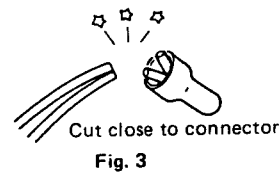
1) **Connector part number :** E03830-001

2) **Required tool :** Connector crimping tool of the proper type which will not damage insulated parts.

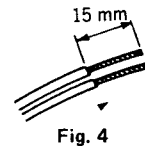
3) **Replacement procedure**

(1) Remove the old connector by cutting the wires at a point close to the connector.

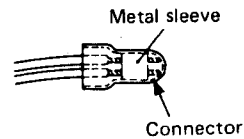
Important : Do not reuse a connector (discard it).



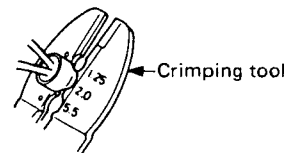
(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.



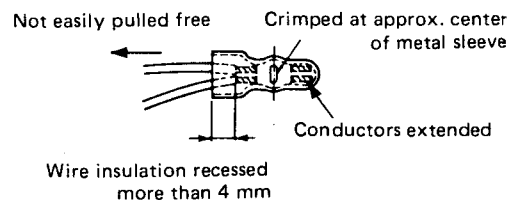
(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.



(4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.



(5) Check the four points noted in Fig. 7.



● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions. Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. Insulation resistance test

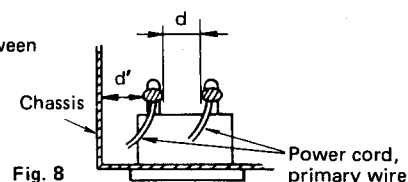
Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. Dielectric strength test

Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. Clearance distance

When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.



4. Leakage current test

Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

Measuring Method: (Power ON)

Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

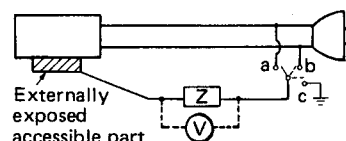


Fig. 9

5. Grounding (Class I model only)

Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).

Measuring Method:

Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

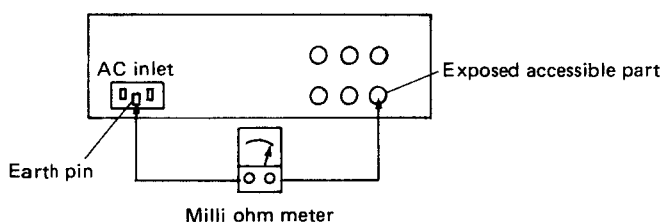


Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	$Z \leq 0.1 \text{ ohm}$
Europe & Australia	$Z \leq 0.5 \text{ ohm}$

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	$R \geq 1 \text{ M}\Omega / 500 \text{ V DC}$	AC 1 kV 1 minute	$d, d' \geq 3 \text{ mm}$
100 to 240 V			AC 1.5 kV 1 minute	$d, d' \geq 4 \text{ mm}$
110 to 130 V	USA & Canada	—	AC 900 V 1 minute	$d, d' \geq 3.2 \text{ mm}$
110 to 130 V	Europe & Australia	$R \geq 10 \text{ M}\Omega / 500 \text{ V DC}$	AC 3 kV 1 minute (Class II)	$d \geq 4 \text{ mm}$
200 to 240 V			AC 1.5 kV 1 minute (Class I)	$d' \geq 8 \text{ mm (Power cord)}$ $d' \geq 6 \text{ mm (Primary wire)}$

Table 1 Specifications for each region

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	$1 \text{ k}\Omega$	$i \leq 1 \text{ mA rms}$	Exposed accessible parts
110 to 130 V	USA & Canada	$0.15 \mu\text{F}$ in parallel with $1.5 \text{ k}\Omega$	$i \leq 0.5 \text{ mA rms}$	Exposed accessible parts
110 to 130 V	Europe & Australia	$2 \text{ k}\Omega$	$i \leq 0.7 \text{ mA peak}$ $i \leq 2 \text{ mA dc}$	Antenna earth terminals
220 to 240 V		$50 \text{ k}\Omega$	$i \leq 0.7 \text{ mA peak}$ $i \leq 2 \text{ mA dc}$	Other terminals

Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

INSTRUCTIONS

Thank you for purchasing the JVC HR-S8000U Super VHS Hi-Fi Stereo Digital Video Cassette Recorder. This unit provides a breath-taking improvement in picture quality, with over 400 lines of picture resolution to double your video enjoyment. True hi-fi stereo complements the superb Super VHS pictures. In addition, a tremendous array of digital functions and other video features are also incorporated in the HR-S8000U.

Before using this video recorder, read this instruction booklet carefully so that you will obtain the best results from your HR-S8000U.

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CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE THE COVER OR
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Note to CATV system installer:
This reminder is provided to call the CATV system installer's attention to Article 820-22 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

WARNING:
TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

This video cassette recorder should be used with AC 120 V~, 60 Hz only.

CAUTION:
To prevent electric shocks and fire hazards, do NOT use any other power source.

CAUTION
When you are not using the HR-S8000U for a long period of time, it is recommended that you disconnect the power cord from the AC outlet.

CAUTION
TO PREVENT ELECTRIC SHOCK DO NOT USE THIS POLARIZED PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

ATTENTION:
Pour prévenir l'électrocution, ne pas utiliser cette fiche polarisée avec un prolongateur, une prise de courant ou une autre sortie de courant, sauf si les lames peuvent être insérées à fond sans en laisser aucune partie à découvert.

NOTE: The rating plate and the safety caution are on the rear of the unit.

Cassettes marked "SVHS" and "VHS" can be used with this video cassette recorder. However, S-VHS recordings are possible only with cassettes marked "S-VHS".





A Consumer Video Products Safety Guide

Electrical energy can perform many useful functions. But improper use can result in potential electrical shock or fire hazards. This unit has been engineered and manufactured to assure your personal safety. In order not to defeat the built-in safeguards, observe the following basic rules for its installation, use and servicing.

ATTENTION:

Follow and obey all warnings and instructions marked on your video product and its operating instructions. For your safety, please read all the safety and operating instructions before you operate this unit and keep this brochure and the operating instructions packaged with your video product for future reference.

INSTALLATION

1. Grounding or Polarization

(A) Your video product may be equipped with a polarized alternating-current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature.

If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug.

(B) Your video product may be equipped with a 3-wire grounding-type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding-type plug.

2. Power Sources

Operate your unit only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home, consult your appliance dealer or local power company. If your unit is intended to operate from battery power, or other sources, refer to the operating instructions.

3. Overloading

Overloaded power outlets and extension cords are dangerous; so are frayed cords and broken plugs. Any of these may result in a shock or fire hazard. Call your service technician for replacement of such cords and plugs. Extension cords or adaptors that defeat the safety purpose of polarized or 3-wire grounding-type plug power cords should not be used.

4. Power Cord Protection

Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.

5. Ventilation
Slots and openings in the cabinet are provided for ventilation. To ensure reliable operation of the unit and to protect it from overheating, these openings must not be blocked or covered.

- Do not block the openings by placing the unit on a bed, sofa, rug or other similar surface.
- Do not place the unit near or over a radiator or heat register.
- Do not place the unit in a built-in installation is provided or bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.

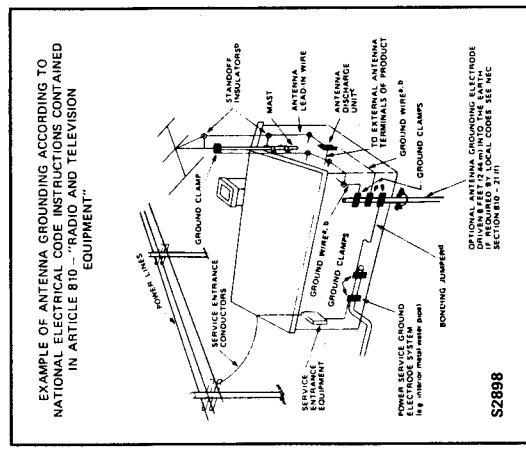
ANTENNA INSTALLATION INSTRUCTIONS

1. Outdoor Antenna Grounding

If an outside antenna or cable system is connected to the video recorder or tuner, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Section 810 of the National Electrical Code, ANSI/NFPA No. 70-1984, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electrodes and requirements for the grounding electrode.

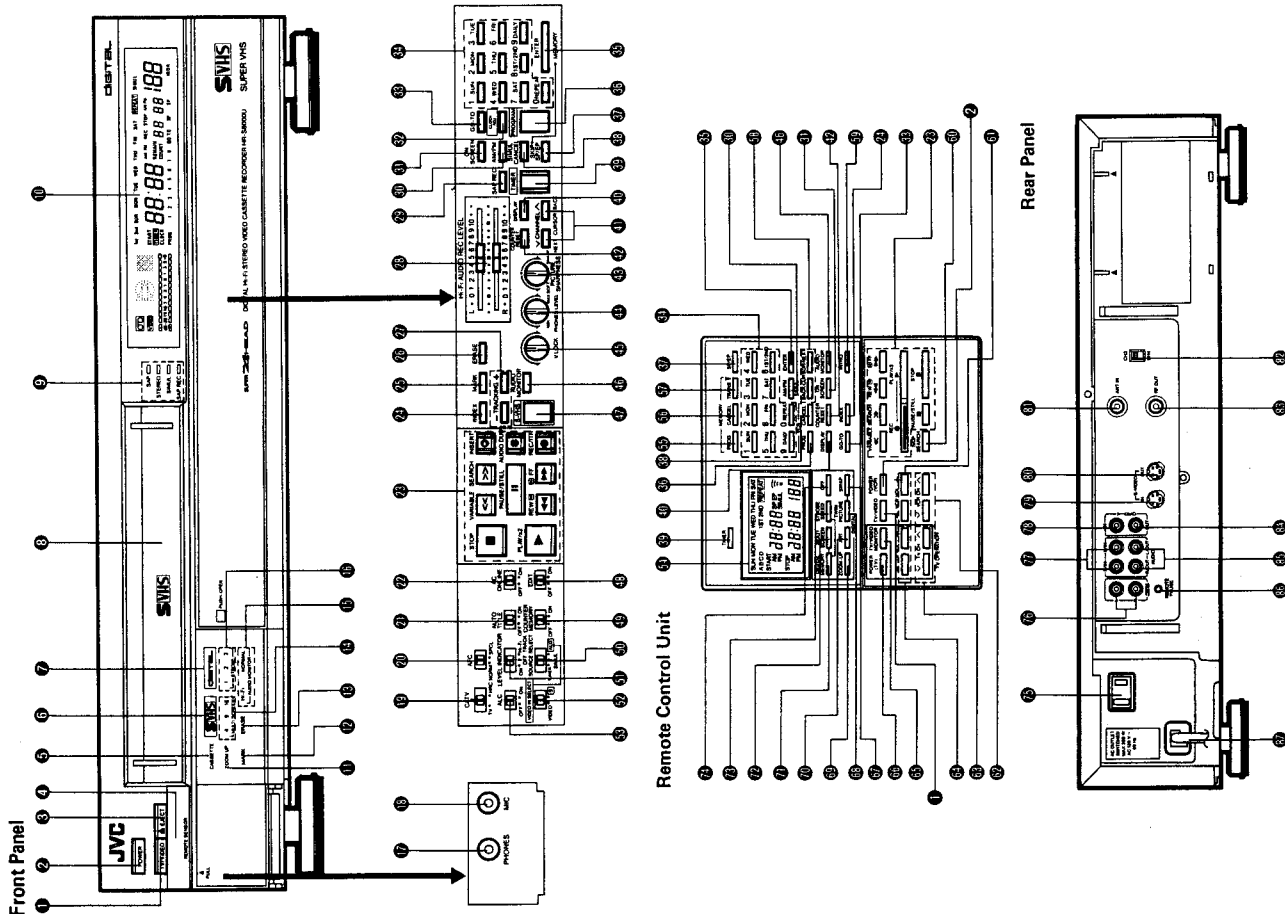
2. Power Lines

To avoid the possibility of a fatal electrical shock, outdoor antennas and lead-in wires should be kept well away from overhead power lines or other electric light or power circuits, or from where they can fall onto such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits as contact with them might be fatal.



BASIC INFORMATION

GENERAL REFERENCE DIAGRAMS



4. Attachments

Do not use attachments not recommended by the manufacturer of this video product as they may cause hazards.

5. Cleaning

Unplug this video product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

6. Lightning

For added protection for the video recorder or tuner during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the video product due to lightning and power-line surges.

SERVISING

1. Servicing

If your video product is not operating correctly or exhibits a marked change in performance and you are unable to restore normal operation by following the detailed procedure in its operating instructions, do not attempt to service it yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

2. Damage Requiring Service

Unplug the video product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

- When the power supply cord or plug is damaged.
- If liquid has been spilled, or objects have fallen into the video product.
- If the video product has been exposed to rain or water.
- If the video product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the video product to its normal operation.
- If the video product has been dropped or the cabinet has been damaged.
- When the video product exhibits a distinct change in performance — this indicates a need for service.

3. Replacement Parts

When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock or other hazards.

4. Safety Check

Upon completion of any service or repairs to this video product, ask the service technician to perform safety checks to determine that the video product is in safe operating condition.

- Use No. 10 AWG (5.3 mm²) copper, No. 8 AWG (8.4 mm²) aluminum, No. 17 AWG (1.0 mm²) copper-clad steel or bronze wire, or larger, as a ground wire.

- Secure antenna lead-in and ground wires to house with standard off insulators spaced from 4 – 6 feet (1.22 – 1.83 m) apart.

- Mount antenna discharge unit as close as possible to where lead-in enters house.

- Use jumper wire not smaller than No. 6 AWG (13.3 mm²) copper, or the equivalent, when a separate antenna-grounding electrode is used. See NEC Section 810-21 (j).

USE

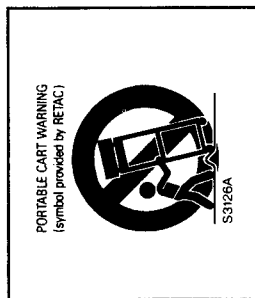
1. Accessories

To avoid personal injury:

- Do not place this video product on an unstable cart, stand, tripod, bracket, or table. It may fall, causing serious injury to a child or adult, and serious damage to the appliance.
- Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer or sold with the video product.
- Use a mounting accessory recommended by the manufacturer and follow the manufacturer's instructions for any mounting of the appliance.
- Do not try to roll a cart with small casters across thresholds or deep-pile carpets.

1A.

An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.



2. Water and Moisture

Do not use this video product near water — for example, near a bath tub, wash bowl, kitchen sink or laundry tub, in a wet basement, or near a swimming pool and the like.

3. Object and Liquid Entry

Never push objects of any kind into this video product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on this video product.

High-Quality Pictures and Sound

- Super VHS recording and playback circuitry ensuring super-quality pictures with a horizontal resolution of more than 400 lines.
- Separated Y/C signal terminals (S-VIDEO IN and OUT) for higher-quality dubbing and playback of Super VHS signals.
- Full set of HQ (High Quality) System circuits to ensure the best possible pictures in the regular VHS mode.
- High-performance CCD luminance signal comb filter for both Super VHS and VHS operation.
- Super DA-4 head system for superlative picture quality in all modes.
- Hi-Fi VHS stereo sound with a dynamic range of more than 90 dB.
- Advanced switching noise reduction system which applies switching point compensation independently for each channel.

Digital Functions

- Digital Freeze to freeze the action, with the soundtrack continuing unaffected.
- Multi-Screen Digital Freeze to sequentially display selected still pictures in a 4-, 9- or 16-frame Multi-Screen mode.
- Digital Strobe to change "frozen" images in sequence at 3 different speeds.
- Multi-Screen Digital Strobe to display still pictures on 4, 9 or 16 sub-screens at 3 different speeds.
- Picture-In-Picture to display a TV broadcast program in an inset window during tape playback, with Swap function to switch pictures between the main screen and the window.
- Digital Mosaic for modern art expressions available in 2 different patterns.
- Digital Solarization for fascinating color changes in 2 different tones.
- Digital Zoom to enlarge the center quarter, or any of the four corners, of the picture into a full-screen picture.
- Multi-Screen Channel Scan to sequentially display on sub-screens a still picture from each tuned-in channel.
- Multi-Screen Intro Search to sequentially display on sub-screens a still picture from the beginning of each recorded program identified by a CTL index code.
- Automatic Recording of a Multi-Screen Intro Search image: after the entire tape is scanned, the multi-screen picture is automatically recorded for about 10 seconds at the beginning of the tape.
- Digitally-enhanced still, 5-step variable slow-motion, and 5-step variable fast-motion playback

Special Features

- LCD-programmable, TV/VCR unified remote control; available functions include:
 - Independent timer programming using 4 built-in program memories and LCD display; the programmed data can be transferred to the recorder at any convenient time.
 - On-screen direct 10-key timer programming
 - All digital functions
 - All tape access functions
 - 10-Key direct-access channel selection
 - Audio monitor selection and output level control
 - Control of television for power on/off, channel selection, TV/VIDEO mode selection and volume setting (designated TVs only)
- Auto Titrer: date, time and channel are recorded automatically at the beginning of a recording each time recording is initiated, or manually when requested; in playback, this recording data can be displayed on-screen.
- Flying erase head for professional-class insert edits.
- VHS Index Search with mark/erase functions; the half-loading mechanism allows the detecting of up to 9 index codes in the rewind, fast-forward or Shuttle Search mode.

Other Value Features

- 181-Channel cable-compatible frequency synthesized tuner
- Built-in MTS decoder
- 14-Day/8-event fully programmable timer
- On-screen mode check and programming
- Audio dubbing
- Edit switch for best possible dubs
- Hi-Fi recording level control with ALC switch
- Peak-hold audio level indicators/Hi-Fi tracking meter
- Variable audio output for more convenience in system integration
- Timer-programmable FM simulcast recording
- 60-Minute memory backup
- Instant timer recording
- Skip search
- Intro Search
- Counter go-to
- Counter memory function
- Next-function memory
- Remaining tape time indicator
- Automatic functions
- Shuttle Search with latch function
- Picture sharpness control
- Electronic tracking controls
- Switchable AC outlet
- Headphone jack with adjustable output
- Microphone jack

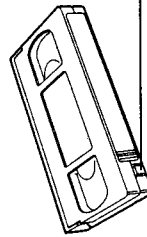
PRECAUTIONS

Handling and storage

- Avoid using the recorder under the following conditions:
 - extremely hot, cold or humid places,
 - dusty places,
 - near appliances generating strong magnetic fields,
 - places subject to vibrations, and
 - poorly ventilated places.
- Be careful of moisture condensation. Avoid using the recorder immediately after moving from a cold place to a warm place. The water vapor in warm air will condense on the still-cold video head drum and tape guides and may cause damage to the tape and the recorder.
- Handle the recorder carefully.
 - Do not block the ventilation openings.
 - Do not place anything heavy on the recorder.
 - Do not place anything which might spill and cause trouble on the top cover of the recorder.
 - Use in horizontal (flat) position only.
 - In case of transportation,
 - Avoid violent shocks to the recorder during packing and transportation.
 - Before packing, be sure to remove the cassette from the recorder.

Video cassettes

- This recorder employs S-VHS and VHS cassettes only.
 - S-VHS: ST-120 for 120(SP)/360(EP) minutes, ST-60 for 60/180 minutes and ST-30 for 30/90 minutes of recording.
 - VHS: T-160 for 160(SP)/480(EP) minutes, T-120 for 120/360 minutes, T-90 for 90/270 minutes, T-60 for 60/180 minutes and T-30 for 30/90 minutes of recording.
- Video cassettes are equipped with a safety tab to prevent accidental erasure. When the tab is removed, recording cannot be performed. If you wish to record on a cassette whose tab has already been removed, use adhesive tape to block the hole.



Safety tab

- Avoid exposing the cassettes to direct sunlight. Keep them away from heaters.
- Avoid extreme humidity, violent vibrations or shocks, strong magnetic fields (near a motor, transformer or magnet) and dusty places.
- Place the cassettes in cassette cases and position vertically.

BASIC INFORMATION

Moisture condensation

- If you pour a cold liquid into a glass, water vapor in the air will condense on the surface of the glass. This is called moisture condensation.
- Moisture condensation on the head drum, one of the most crucial parts of the video recorder, will cause damage to the tape.
- Moisture in the air will condense on the recorder when you move it from a cold place to a warm place, or under extremely humid conditions.
- In conditions where moisture condensation may occur, keep the power cord plugged in an AC outlet and the POWER switch set to ON; this would help prevent condensation from occurring. When condensation has occurred, it will not evaporate quickly once the power is switched on. Wait a few hours for the recorder to become dry.

Operation

- When a cassette is loaded, the power is switched on and, if the safety tab has been removed, playback begins automatically.
- The cassette can be unloaded even when the power is off. Pressing the EJECT button turns the power on and, after ejection of the cassette, shuts it off automatically in this case.
- As long as the TIMER button is engaged with the TIMER indicator lit, the POWER and EJECT buttons have no effect and unloading of a cassette is not possible. If a cassette has not yet been inserted, simply insert a cassette; the power will be switched on to load the cassette properly and, after completion of automatic loading, the Timer Recording Standby mode will be engaged with power off.

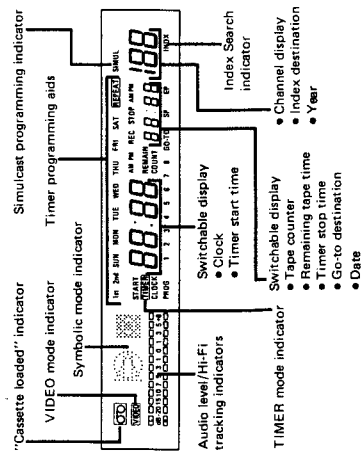
Remote control unit

- Avoid violent shocks, especially take care not to drop the unit.
- Take care not to allow liquid to spill into the unit or dampen the terminals.
- Do not place heavy objects on the unit.
- Avoid leaving the unit in places subject to direct sunlight or extremely high temperatures.

CONTROLS, INDICATORS AND CONNECTORS

Front Panel

- **TV/VIDEO button**
Selects between TV and VIDEO modes.
TV mode (the VIDEO indicator on the fluorescent display [FDP] is off): for TV viewing and for watching a TV program while recording another.
- **VIDEO mode ("VIDEO")** appears on the FDP: for recording a TV program while watching it and for playing back recorded tapes. When the power is switched on, initially the TV mode is engaged. If you want to change the mode, press the TV/VIDEO button.
- **POWER button with green indicator**
Press to apply power to the HR-S8000U for recording or playback. The indicator will light. Loading a cassette also turns the power on.
- **Cassette EJECT button**
- **Infrared beam receiving window (REMOTE SENSOR)**
- **S-VHS CASSETTE indicator**
This LED lights when a cassette marked S-VHS is inserted, with the cassette mark also appearing on the fluorescent display panel (FDP). With a regular VHS cassette, only the cassette mark on the FDP lights.
- **S-VHS mode indicator**
The "S-VHS" indicator illuminates when the S-VHS recording mode is selected with the S-VHS mode select button ① or when S-VHS recordings are being played back. In playback, S-VHS recordings are automatically detected and played back in the S-VHS mode.
- **DIGITAL indicator**
Lights when a digital function is in operation.
- **Cassette loading slot**
Insert a VHS video cassette. The door will close and the indicator showing that a cassette is inside will appear on the FDP.
- **Audio program indicators**
Lights when a TV program accompanied by a S-A-P: second audio program is being received.
- **STEREO:** Lights when a stereophonic program is being received.
- **SIMUL:** Lights when the SOURCE SELECT switch ② is set to SIMUL.
- **SAP REC:** Lights when the SAP REC button ③ is pressed to record a second audio program on the normal audio track.
- **Comprehensive fluorescent display panel (FDP)**
Fully explained in relevant sections.



BASIC INFORMATION

- **PAUSE/STILL button**
Press to stop the tape temporarily to avoid recording of unwanted material or to view a still picture. The still picture can be advanced each time this button is pressed.
- **REW button**
To rewind the tape, press this button while in the Stop mode. To view the speeded-up picture in the reverse direction for program search, press this button while in the Play mode; press the PLAY/x2 button to return to normal playback. (See page 24.)
- **FF button**
To fast forward the tape, press this button while in the Stop mode. To view the speeded-up picture in the forward direction for program search, press this button while in the Play mode; press the PLAY/x2 button to return to normal playback. (See page 24.)
- **VARIABLE SEARCH buttons**
To control the search speed; both slow-motion and fast-motion search are available. The slow-motion speed can be changed in 5 steps: 1/6, 1/12, 1/18, 1/24 and 1/30 normal speed. For fast-motion search, available speeds are x1, x3, x5 and x7 in both directions and x2 in the forward direction in the SP mode; x1, x3, x5, x7 and x21 in both directions and x2 in the forward direction in the EP mode. No audio is available in the Variable Search mode. To cancel the Variable Search mode, press the PLAY/x2 button. (See page 24.)
- **INSERT button**
Press for insert editing. (See page 41.)
- **AUDIO DUB button**
Press together with the PLAY/x2 button for audio dubbing. (See page 40.)
- **INDEX button**
Press to engage the Index Search mode. (See page 28.)
- **MARK button**
Press during playback or recording to put an index code onto the tape. (See page 28.)
- **ERASE button**
Press during playback to erase an index code. (See page 28.)
- **TRACKING -/H buttons**
If noise bars are seen during playback, use these buttons to reduce them. The tracking is reset to normal when both buttons are pressed together, a cassette ejected, or the power turned off.
- These TRACKING buttons can also be used to adjust hi-fi tracking, referring to the hi-fi tracking meter. (See page 20.)
- **Hi-Fi AUDIO REC LEVEL controls**
See page 19.
- **SAP REC button**
Press this button when recording the SAP program on the normal audio track. The SAP REC indicator ④ will light.
- **AM/PM/SIMUL button**
Press this button to specify AM or PM in clock or timer setting. This button is also used to program timer-controlled FM simulcast recording.
- **ON-SCREEN button**
The 5-second on-screen display for mode check is automatically available each time the mode is changed or called up manually by pressing the ENTER button ⑤ or this ON SCREEN button. (See page 22.) The on-screen display for timer programming, which is called up by pressing the PROGRAM button ⑥, can be cancelled by pressing the ON SCREEN button. (See page 37.)
- **CLOCK ADJ button**
Press to restore a skipped channel or to tune to the selected channel instantly (see page 16). Also use to call up the mode check display on the TV screen (see page 22) or for timer programming and clock setting.
- **PROGRAM button**
Press this button when you want to preset the timer for unattended recording. (See page 36.)
- **SP/EP select button**
Press to SP position when you wish recordings to be made in the SP (Standard Play) mode. When you wish to record longer TV shows or for unattended and prolonged recording of a number of TV shows with a combined time of up to 8 hours (with a T-160 cassette), press to EP (Extended Play).
- **CANCEL/SKIP button**
Press to skip unnecessary channels. (See page 16.) In the program set mode, it can function as the CANCEL button. (See page 39.)
- **TIMER button**
Press to engage the Timer Standby mode after you have preset the timer for unattended recording.
- **DISPLAY button**
Press to switch the smaller 4-digit display in the sequence of tape counter to remaining tape time display to date. (See pages 27 and 29.)
- **CHANNEL/CURSOR (NEXT/BACK) buttons**
Press either button to select a desired channel. Can also be used as cursor keys in clock setting and timer programming.
- **COUNTER RESET button**
Use this control to make the picture sharper or softer. Effective only for playback pictures. (No effect for recording.)
- **PHONES LEVEL control**
Adjusts the level of the audio output from the headphone jack.
- **V LOCK control**
When operating in the Still, Freeze or Strobe mode, turn this control to eliminate vertical vibrations of the picture, if observed.
- **AUDIO MONITOR button**
Press to select the audio output. Each time the button is pressed, the soundtrack to be output changes (Hi-Fi stereo, normal, or mixed playback) and is indicated by the Hi-Fi and NORMAL indicators ⑦.
- **S-VHS mode select button**
This button switches between S-VHS and VHS recording modes. When the S-VHS mode is selected, the S-VHS indicator ⑧ illuminates. S-VHS recordings are possible only when S-VHS cassettes are used in the S-VHS recording mode.

EDIT switch

Normally set to OFF. For making multi-generation dubs, set it to the ON position. (See page 42.)

COUNTER MEMORY switch

When this switch is set to ON, the tape will stop automatically at the counter reading of about "0000" in the Rewind or Fast Forward mode.

SOURCE SELECT switch

For selecting the recording input signal.
TUNER: To record signals coming from the built-in tuner.
SIMUL: To record the video signal and normal audio signal from the built-in tuner and the hi-fi audio signal from the rear panel AUDIO IN connectors.
When recording FM simulcast TV programs, use this position.

AUX: To record signals coming from a unit connected to the VIDEO IN and AUDIO IN connectors.

LEVEL INDICATOR switch

Selects the function of the audio level/hi-fi tracking meter on the FDP.

ON: To obtain the indication of audio level.

OFF: To use the meter for hi-fi tracking adjustment.

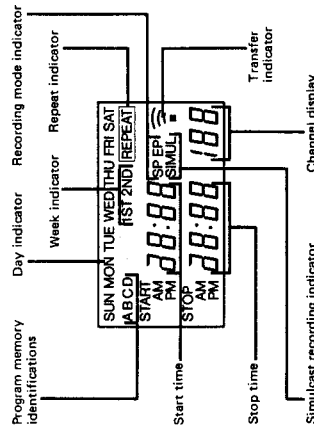
HI-FI TRACK: To use the meter for hi-fi tracking adjustment.

Remote Control Unit

The infrared remote control unit gives you full operation control from your viewing position. All control buttons, except those separately explained, have the same function as the corresponding buttons on the recorder. However, in the case of the REC button, to start recording, both the REC and PLAY/x2 buttons must be pressed simultaneously. The maximum operating distance is about 8 m (26 ft).

LCD (Liquid Crystal Display) panel

Refer to this panel when programming the remote control's built-in timer memory.



MEMORY PROG. button

Press to program the remote control's timer memory.

MEMORY CANCEL button

Press to cancel the programmed data in the remote control's timer memory.

MEMORY TRANS button

Press to transfer the data held in the memory to the recorder.

VIDEO IN SELECT switch

When the SOURCE SELECT switch is set to AUX, set this VIDEO IN SELECT switch according to the source connection.

VIDEO: Set to this position when recording a source connected to the VIDEO IN connector.

S: Set to this position when recording a source connected to the S-VIDEO IN connector (which accepts separated luminance and chrominance signals).

ALC switch

Set to ON to activate the automatic level control circuit for Hi-Fi audio. For manual control of the hi-fi audio recording level, set this switch to OFF and use the Hi-Fi AUDIO REC LEVEL controls for adjustment.

CURSOR (BACK/NEXT) buttons

Use these buttons to advance the cursor or move it back to a previous position during timer programming.

INTRO button

Press to engage the Intro Search mode. See pages 29 and 35.

SKIP SEARCH button

In the Play mode, press once to zip (advance rapidly) through the following 30 seconds of tape. This button may be pressed up to four times to zip through 2 min. of tape. Press PLAY to cancel the Skip Search mode. (See page 23.)

VCR VOL. (+/-) buttons

Press these buttons to adjust volume of an audio amp or TV connected to the rear panel VARIABLE AUDIO OUT connectors.

VCR CH (V/Λ) buttons

Press either button to select desired channels received by the VCR's built-in tuner.

TV CH V/Λ buttons

Press to scan to a desired channel on the TV receiver.

TV VOL. (-/+) buttons

Press "−" or "+" to decrease or increase the TV's sound volume.

TV/VIDEO MONITOR button

Press to select TV's Video mode or TV mode. (Designated TV models only.)

POWER (TV) button

Press to turn the TV power on or off. (Designated TV models only.)

SWAP button

While in the Picture-In-Picture mode, press to switch the pictures between the main screen and window.

TWIN PICTURE button

During tape playback, press to display a TV broadcast program in an insert window (Picture-In-Picture mode). Additional pressing of this button shifts the position of the window.

ZOOM UP button

Press to zoom up the desired quarter of the picture to fill the screen. (See page 33.)

ART button

Press to select the desired digital art effects; two different solarization effects and two different mosaic patterns are available in sequence. (See page 33.)

DIGITAL MEMORY button

Press to engage the digital memory for a variety of digital functions. See pages 31 to 35.

MULTI SCREEN button

Press to select the desired number of sub-screens (4, 9 or 16) for a variety of multi-screen functions. See pages 31 to 35.

STROBE SPEED button

Press to select the desired strobe speed in the Strobe or Multi-Screen Strobe mode. See page 32.

OFF button

Press to disengage any digital function and restore normal pictures. See pages 31 to 35.

Remote Control Unit

A/B mode switching

A switch on the back of the remote control labelled A/B is accessible when the battery compartment cover is removed.

• This switch is preset to the "A" position. Do not touch it unless you use two JVC video decks side by side.

• When you place two JVC video decks near each other, use this remote control in the "B" mode to prevent both decks from responding simultaneously to this remote control's signals. For this purpose, carefully follow the instructions below:

(1) Unplug the power cord of the HR-S8000U from the AC outlet.

(2) Set the remote control unit's A/B mode switch to "B".

(3) Plug the power cord of the HR-S8000U into the AC outlet.

(4) Turn on the power of the HR-S8000U using the remote control's VIDEO POWER button.

• The HR-S8000U "memorizes" this B code and then will respond only to the signals of this remote control unit. The other deck will respond only to its remote control.

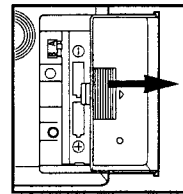
Note

Do not operate other remote controls after you have plugged the HR-S8000U into the AC outlet and before you press the VIDEO POWER button of this remote control.

CAUTION: Some televisions may malfunction in response to this remote control when used in the "B" mode. If this should happen, switch the mode back to "A".

Installing the batteries

- Slide the battery compartment cover on the rear of the unit in the direction of the arrow (▶).
- Insert 2 "AA"-size batteries (provided) in the correct directions in the battery compartment.
- Replace the cover.



Rear Panel

AC OUTLET

Connect the power cord of other audio or video equipment (such as an FM tuner) requiring less than 300 watts of power. The power flow through this outlet is controlled by the AC ONLINE switch.

VARIABLE AUDIO OUT terminals

Connect to the AUDIO IN terminals of another video recorder for tape-to-tape transfer, or the AUDIO IN terminals of a television or video monitor for playback. Convenient for connecting a non-JVC-brand TV in order to control that TV's volume with the VCR VOL. (+/-) buttons on the remote control unit.

AUDIO IN terminals

Connect to the AUDIO OUT terminals of another video recorder for tape-to-tape transfer, or the AUDIO OUT terminals of the camera adapter for camera recording.

VIDEO IN terminal

Connect to the VIDEO OUT terminal of another video recorder for tape-to-tape transfer, or the VIDEO OUT terminal of the camera adapter for camera recording.

S-VIDEO IN connector

This is a special connector (4-pin) to accept separated luminance and chrominance signals. To record this type of video signal, connect an appropriate source to this terminal using the provided video cable. Use the AUDIO IN connectors for making audio signal connections. When recording from this connector, set the VIDEO IN SELECT switch to S.

S-VIDEO OUT terminal

This is a special connector (4-pin) to deliver separated luminance and chrominance signals. For tape-to-tape transfer of S-VHS recordings, connect this terminal to the S-VIDEO IN terminal of a 2nd S-VHS video recorder using the provided video cable. Or connect to the same type of connector of a television or monitor equipped with an S-VIDEO input terminal. In these cases, use the AUDIO OUT terminals or for making audio connections.

ANT IN terminal

Connect the antenna cable or a Cable TV Line. If necessary, use the matching transformer (provided).

RF output channel select switch

See "VIDEO CHANNEL SETTING" on page 14.

RF OUT terminal

Connect to the all-channel antenna connector (female F) of a TV receiver using the antenna cable (provided). If your TV receiver has separate VHF/UHF 300-ohm antenna terminals only, use the antenna splitter (provided) to connect the antenna cable to these terminals.

VIDEO OUT terminal

Connect to the VIDEO IN terminal of another video recorder for tape-to-tape transfer, or the VIDEO IN terminal of a video monitor for playback.

AUDIO OUT terminals

Connect to the AUDIO IN terminals of another video recorder for tape-to-tape transfer, or the AUDIO IN terminals of a video monitor for playback.

REMOTE PAUSE terminal

When using a JVC video camera, connect the remote control cable of the camera adapter to this terminal for the purpose of controlling the starting and stopping of the tape with the camera's start/stop switch.

AC power cord

Connect to an AC 120 V~, 60 Hz household outlet.

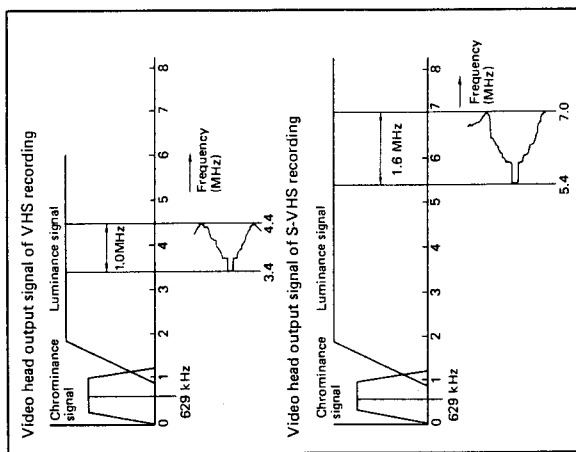
FOR A BETTER UNDERSTANDING OF S-VHS AND VHS

S-VHS vs. VHS

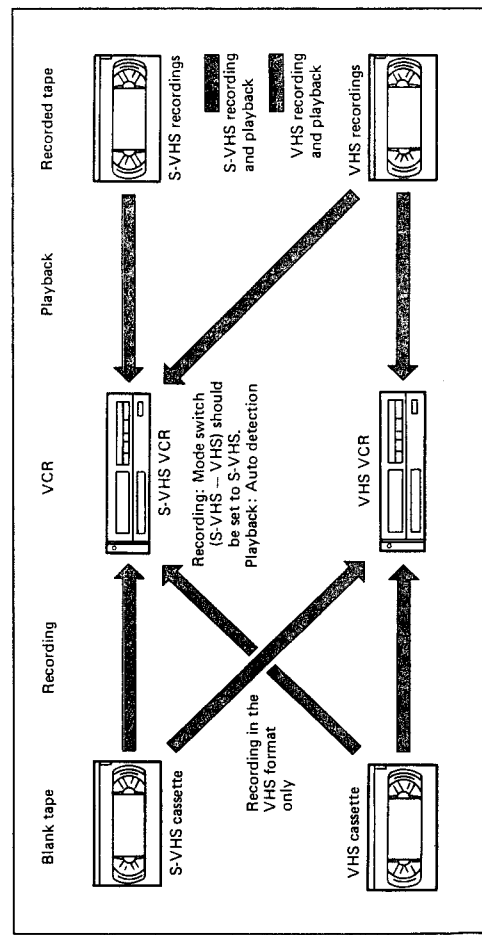
- VHS is the world's most popular video format. If you owned a VCR before the HR-S8000U, most likely it was a VHS machine.
- S-VHS is a new video sub-format based on VHS. It offers superior picture quality with a horizontal resolution of more than 400 lines by shifting the FM carrier frequency of the luminance signal from the conventional 3.4 - 4.4 MHz range to a higher one of 5.4 - 7 MHz.

- The HR-S8000U is equipped for recording and playback in both the S-VHS and VHS formats. Therefore, you can still play back your VHS software programs and previously recorded family recordings.
- You can switch to the world of S-VHS for your new recordings to enjoy breath-taking picture quality. Or to exchange recordings with someone whose VCR is not S-VHS, simply record in the VHS mode, whether with a regular VHS cassette or an S-VHS cassette.

Recording Signal Spectrum

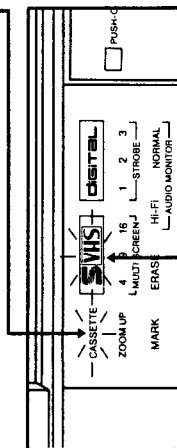


Compatibility between S-VHS and VHS

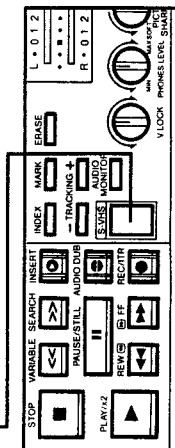


S-VHS Recording

Insert an S-VHS cassette: this indicator will light.

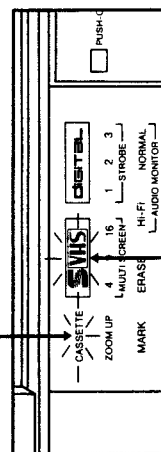


Press the S-VHS button: this indicator will light.



S-VHS Playback

Simply insert a recorded S-VHS cassette: this indicator will light.



When playback starts, this indicator will light automatically.

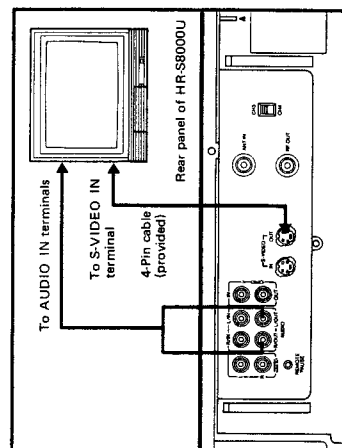
How to take best advantage of S-VHS pictures

For flexibility, the HR-S8000U offers two sets of video input/output terminals: one for the regular composite video signal in which the luminance (Y) and chrominance (C) signals are mixed together, and the other for the separated Y/C signals. No special connections are necessary to record and play back broadcast programs. Simply follow the connecting instructions on the next page.

Using a television with S-VIDEO input

If your television is equipped with an S-VIDEO input (separated Y/C signals) terminal, this is an ideal way to enjoy the best possible S-VHS picture, because no interference occurs between the luminance and chrominance signals.

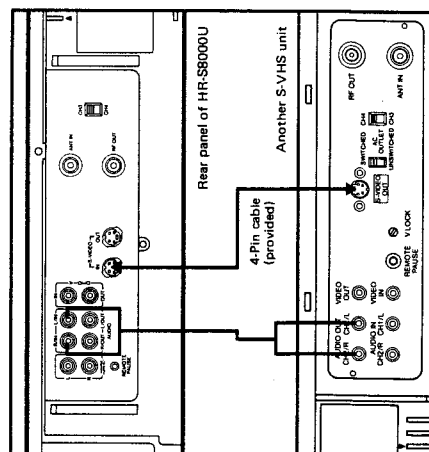
Connect the S-VIDEO OUT terminal of the HR-S8000U to the S-VIDEO IN terminal of your television. To view video cassettes with this setup, set the TV to the VIDEO mode. (It is not necessary to set the TV to channel 3 or 4.) With JVC's AV televisions, switching to the VIDEO mode can be performed on the HR-S8000U's remote control (MONITOR TV/VIDEO button).



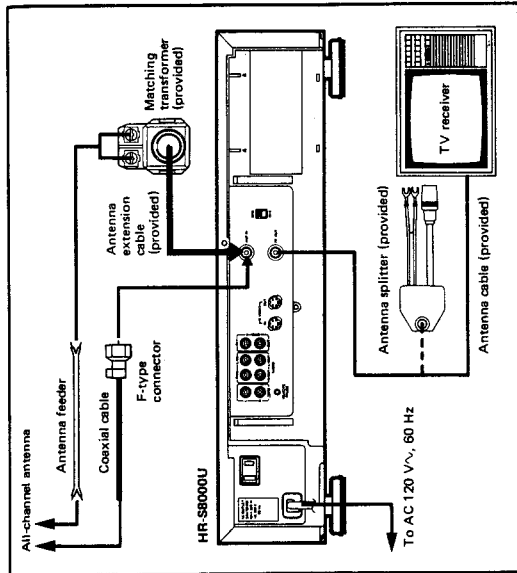
Recording from other S-VHS equipment

For recording sources which deliver separated Y/C signals, use the S-VIDEO IN connector and proceed as follows:

1. Insert an S-VHS cassette.
2. Switch to the S-VHS mode.
3. Set the SOURCE SELECT switch to AUX.
4. Set the VIDEO IN SELECT switch to S.



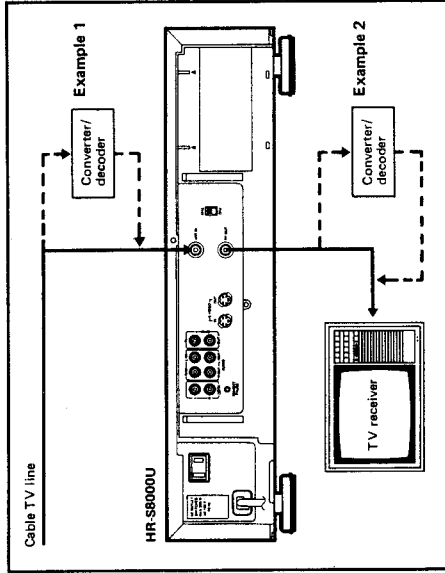
TO VHF AND UHF ANTENNAS



- Procedure**
- Remove the antenna cable from the TV receiver and reconnect to the HR-S8000U's ANT IN connector as illustrated. The HR-S8000U is then ready to record off-air programs.
- Notes:**
- If your antenna cable is a 300-ohm flat feeder, use the provided matching transformer.
 - If your antenna system has separate VHF/UHF lead-in wires, use an antenna mixer and connect its output to the HR-S8000U's ANT IN connector, either directly or through the provided matching transformer depending on the type of the mixer.
 - Connect the HR-S8000U to the TV receiver using the 75-ohm antenna cable (provided).
- Note:** If your TV is equipped with 300-ohm UHF input terminals and a 75-ohm VHF input terminal, use the antenna splitter (provided) to complete connection.

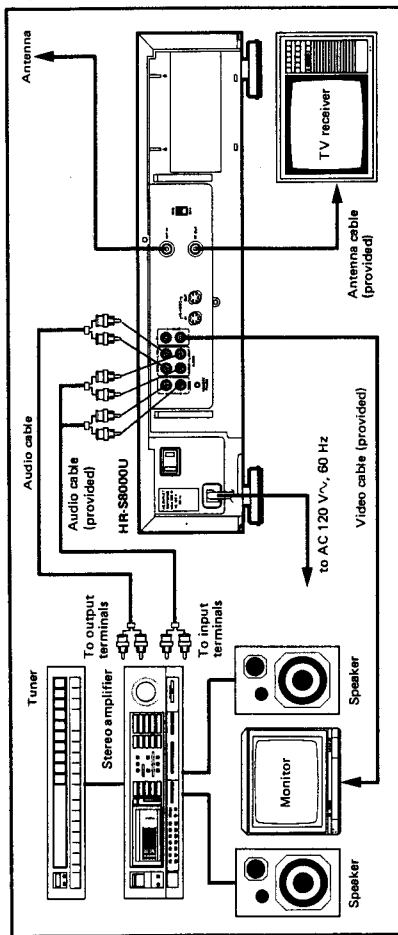
As this unit uses the latest digital technology, a viewer should be taken up connecting the antenna cable. If TV picture interference or distortion occurs, first check whether the proper connections have been made. If there is no improvement, proceed to connect the provided antenna extension cable between the matching transformer and the HR-S8000U, and place the matching transformer away from the unit so that the picture clears.

TO CABLE TV LINE



Note: If your cable TV system does not require a converter/decoder for scrambled signals, you can use the cable-compatible tuner built into the HR-S8000U for viewing and recording. In this case, simply connect the cable TV line to the ANT IN terminal of the recorder and the RF OUT terminal of the recorder to your TV receiver. Please contact your cable TV company for any questions concerning hookups or cable TV operation.

TO A STEREO SYSTEM



- Procedure**
- Connect the AUDIO IN L and R connectors of the HR-S8000U to the recording output terminals of the amplifier. (Exactly as one hooks up an audio cassette deck.)
 - Connect the AUDIO OUT or VARIABLE AUDIO OUT connectors of the HR-S8000U to the AUX IN or TAPE MONITOR terminals of the amplifier.

Application

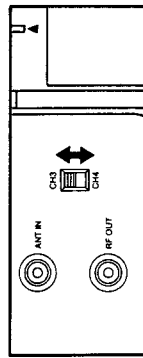
- With this setup, you can enjoy prerecorded Hi-Fi VHS tapes in stereo while viewing them on a regular TV receiver, and also you can record FM simulcast television programs with hi-fi audio accompaniment. See page 40.
- You can also record only audio (without recording any video signal) on both hi-fi and longitudinal audio tracks. This means you can record a continuous 8-hour FM program onto a single cassette (T-180 cassette). See page 40.
- If you want to timer-control the recording of FM simulcast programs, connect the tuner's power cord to the HR-S8000U's AC outlet. Set the AC ONLINE switch to ON, and both the tuner and the HR-S8000U will be switched on at a time preprogrammed by the HR-S8000U. Timer-controlled recording of FM simulcast programs is not possible with the type of tuners which reset the channel each time the power is switched off.

CAUTION:

- The HR-S8000U has a dynamic range of more than 90 dB with regards to its hi-fi audio capability. It is recommended that you check the maximum level if you are going to listen to the hi-fi audio signals through a stereo amplifier. A sudden surge in speaker input may cause speaker damage.
- Some speakers and televisions are specially shielded to prevent television interference. If both are of the non-shielded type, do not place the speakers adjacent to the TV set, otherwise the video playback picture will not be normal because of mutual interference.

VIDEO CHANNEL SETTING

The built-in RF converter permits playback of video and audio recordings through a TV receiver. The signals from the RF converter are viewed through a vacant channel not used for broadcasting in your viewing area.



The converter channel of all units is set to 3 prior to shipment from the plant. Reset the channel to 4 in areas where channel 3 is employed for broadcasting. For this purpose, slide the channel select switch on the rear of the unit to CH 4. This is YOUR video channel. To view video cassettes, always set the TV channel selector to either channel 3 or 4.

OPERATING THE BUILT-IN TUNER

The HR-S8000U incorporates an advanced frequency synthesized tuner which is pretuned to VHF channels 2 through 13, UHF channels 14 through 69 and 113 (excluding 12 VHF broadcasts) cable TV channels* (including mid, super, hyper and ultra bands). There is no need to preset the tuner; it automatically receives the broadcast corresponding to the channel number displayed.

* In Canada: 110 (excluding 12 VHF broadcasts) cable TV channel capability.

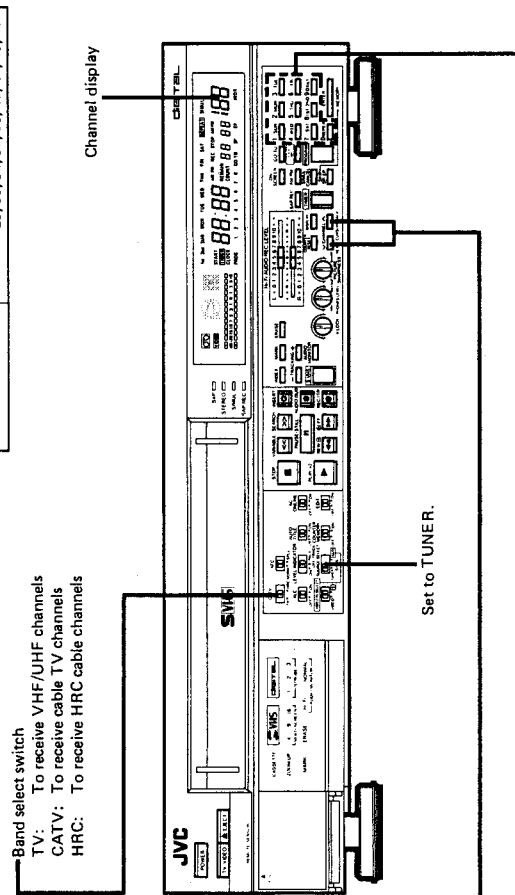
Note: If the picture is not clear, perform fine tuning on your television.

BAND switch setting		Channels
CATV	VHF	2 through 13
TV	CATV	14, 18, 23, 29, 36, 48, 49
	VHF	2 through 13
	UHF	14, 15, 17, 18, 20, 22, 23, 25, 27, 29, 30, 32, 35, 36, 40, 44, 48, 49

Band select switch

TV: To receive VHF/UHF channels
CATV: To receive cable TV channels
HRC: To receive HRC cable channels

Channel display



Set to TUNER.

Scanning channels

Channels can be "called up" in ascending or descending order by using the CHANNEL $\nabla/\wedge$ buttons on the front control panel. To scan channel numbers which are higher than the channel being received, press and hold the CHANNEL $\wedge$ button. Release when the desired channel is reached. Press and hold the CHANNEL ∇ button to scan lower numbered channels. Release when the desired channel is reached.

Selecting channels

1 To select a channel, simply press the numeric keys. The channel number selected will appear on the display; the channel will change automatically within 2 to 3 seconds after the last numeric key is pressed.
2 To change channels immediately, press the ENTER button after pressing the numeric keys.

Note:

- If an invalid channel is entered, the entered data is cleared and the display returns to the previous number.

BASIC INFORMATION

Programming favorite channels

Skipping unused channels makes it possible to scan only those channels which are active in your area.

Skipping channels

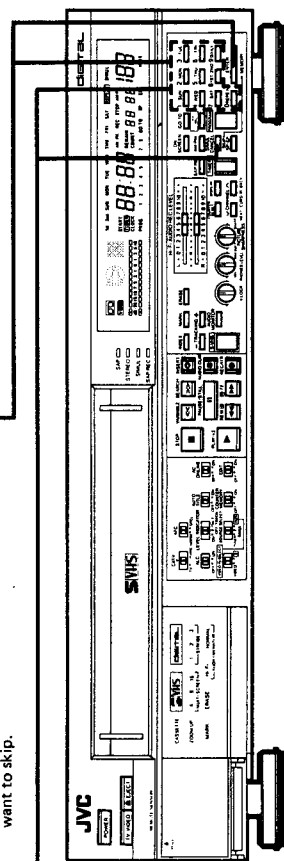
- Select the channel you want to skip with numeric keys or up/down tuning.
- Press CANCEL/SKIP.
 - The letters "PO" will appear momentarily in place of the channel number, indicating that the corresponding channel has been skipped.
 - The channel is now eliminated from the up/down scanning sequence. Repeat for each channel you want to skip.

Note:

If the recorder is unplugged from the AC outlet, or there has been a power interruption, favorite channel programming will be maintained. There is no need to re-program channels.

Storing channels

- Press the numeric keys to select the channel you want to re-enter.
- Press ENTER within 2 seconds.
 - The channel "entered" will now be available when the channel scanning sequence is used.



Cable (CATV) Channel Reference Chart

The Cable TV (CATV) Channel Reference Chart is supplied for your convenience. Fill in the name or number of the actual station being provided by your CATV company on each CATV channel. (Your CATV company should give you this information.)

If the TV tuner is NOT connected to a CATV antenna system, it is important that the Band Select switch be in the TV position to properly receive VHF channels 2 through 13 and UHF channels 14 through 69.

Note: CATV channels A-1, A-2 & A-8 are not available in Canada.

CATV channel	2	3	4	4 ⁵	5	6	A-5	A-4	A-3	A-2	A-1	A	B	C	D	E	F	G
Channel number indication	2	3	4	1	5	6	95	96	97	98	99	14	15	16	17	18	19	20
Actual TV station																		
CATV channel	H	I	J	K	L	M	N	O	P	Q	R							
Channel number indication	21	22	7	8	9	10	11	12	13	23	24	25	26	27	28	29	30	31
Actual TV station																		
CATV channel	S	T	U	V	W	W ¹	W ²	W ³	W ⁴	W ⁵	W ⁶	W ⁷	W ⁸	W ⁹	W ¹⁰	W ¹¹	W ¹²	W ¹³
Channel number indication	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
Actual TV station																		
CATV channel	W ¹⁴	W ¹⁵	W ¹⁶	W ¹⁷	W ¹⁸	W ¹⁹	W ²⁰	W ²¹	W ²²	W ²³	W ²⁴	W ²⁵	W ²⁶	W ²⁷	W ²⁸	W ²⁹	W ³⁰	W ³¹
Channel number indication	NN	OO	PP	QQ	RR	SS	TT	UU	VV	WW	XX	YY	ZZ	AAA	BBB	CCC	DDD	EEE
Actual TV station																		
CATV channel	W ³²	W ³³	W ³⁴	W ³⁵	W ³⁶	W ³⁷	W ³⁸	W ³⁹	W ⁴⁰	W ⁴¹	W ⁴²	W ⁴³	W ⁴⁴	W ⁴⁵	W ⁴⁶	W ⁴⁷	W ⁴⁸	W ⁴⁹
Channel number indication	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85
Actual TV station																		
CATV channel	W ⁵⁰	W ⁵¹	W ⁵²	W ⁵³	W ⁵⁴	W ⁵⁵	W ⁵⁶	W ⁵⁷	W ⁵⁸	W ⁵⁹	W ⁶⁰	W ⁶¹	W ⁶²	W ⁶³	W ⁶⁴	W ⁶⁵	W ⁶⁶	W ⁶⁷
Channel number indication	86	87	88	89	90	91	92	93	94	100	101	102	103	104	105	106	107	108
Actual TV station																		
CATV channel	W ⁶⁸	W ⁶⁹	W ⁷⁰	W ⁷¹	W ⁷²	W ⁷³	W ⁷⁴	W ⁷⁵	W ⁷⁶	W ⁷⁷	W ⁷⁸	W ⁷⁹	W ⁸⁰	W ⁸¹	W ⁸²	W ⁸³	W ⁸⁴	W ⁸⁵
Channel number indication	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	
Actual TV station																		

INFORMATION ON THE HR-S8000U'S AUDIO SYSTEM

Hi-Fi and normal audio

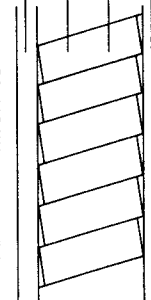
To provide true hi-fi audio accompaniment to video entertainment and, at the same time, compatibility with regular VHS tapes, the HR-S8000U employs a unique audio recording system. Hi-fi audio signals (2-channel) are recorded deep into the tape's magnetic coating, and the video signal is recorded on top of the audio signals in a shallower layer. At the same time, another audio head records normal audio signals (monaural) onto the usual longitudinal audio track. Since this longitudinal audio track is exactly the same as on regular VHS tapes, tapes

recorded on the HR-S8000U can be played back on other VHS machines, and vice versa.

CAUTION:

- The hi-fi soundtrack recorded with the HR-S8000U cannot be reproduced with video equipment other than Hi-Fi VHS.
- Tapes recorded with a conventional stereo video recorder produce monaural sound when played back with the HR-S8000U.

Tape pattern recorded with the HR-S8000U



Hi-fi audio recording and reproduction are available only from the hi-fi audio track while the longitudinal audio track provides normal audio.

The hi-fi and normal soundtracks are recorded simultaneously, and audio dubbing is applicable only to the normal audio.

MTS (Multichannel Television Sound) compatibility

When stereo and SAP programs are being received, the indicators light to inform you of the type of broadcasts. Then you can select the desired soundtrack for recording with a single switch.

SAP REC indicator

SAP REC button

This button selects the soundtrack to be recorded on the normal audio track when an MTS broadcast is being received and functions only when the SOURCE SELECT switch is set to either TUNER or SIMUL.

- Press to record an SAP soundtrack on the normal audio track. (The main soundtrack, either mono or stereo, will be recorded on the hi-fi audio track.)
- Release to record a main soundtrack on the normal audio track. Stereo programs will be recorded in mono (L + R mixed) on the normal audio track (and in stereo on the hi-fi audio track).

SOURCE SELECT switch

STEREO indicator

Lights when a stereo program is being received. For recording the SAP soundtrack, press the SAP REC button. The SAP REC indicator will light.

If the STEREO and SAP indicators light, it means that a stereo + SAP program is being received. If you want to record both soundtracks, press the SAP REC button. (The SAP REC indicator will light). Then the stereo soundtrack will be recorded on the hi-fi audio track and the SAP soundtrack will be recorded on the normal audio track.

Note:

- Off-air MTS programs are received in accordance with the Broadcast Television Systems Committee (BTSC) standard. The method of transmission of stereo programs via cable varies from area to area and may not be compatible with the BTSC standard. Consult your local cable company for compatibility in your area.

Recording options according to the settings of the SOURCE SELECT switch

Track	Video track	Normal audio track (mono)	Hi-fi audio track (2-channel)
SOURCE SELECT switch position			
TUNER	TV picture (from built-in tuner)	TV sound (from built-in tuner) (Mixing with microphone input is possible.)	
SOURCE SELECT switch position			
SIMUL	TV picture (from built-in tuner)	TV sound (from built-in tuner)	Audio signal from AUDIO IN (Mixing with microphone input is possible.)
AUX	Video signal from VIDEO IN or S-VIDEO IN (depending on the setting of VIDEO IN SELECT switch)	Audio signal from AUDIO IN (Mixing with microphone input is possible.)	

Note:

- You can record audio only (without recording any video signal) on the normal and hi-fi audio tracks. This means you can record a continuous 8-hour FM program onto a single cassette (T-160). For this purpose, set the SOURCE SELECT switch to AUX and connect an audio source, such as an FM tuner, to the AUDIO IN connectors. Nothing should be connected to the VIDEO IN connector.

Recording options according to the type of broadcasts and the setting of the SAP REC button (indicated by the SAP REC indicator)

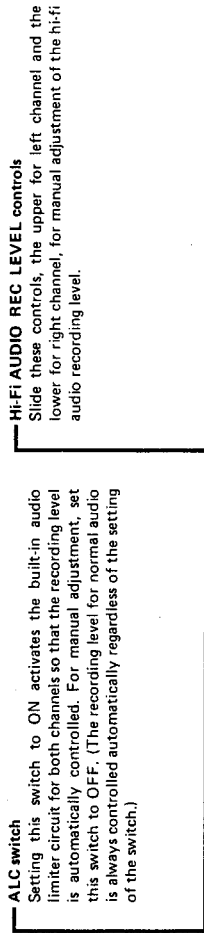
SAP REC button and SAP REC indicator	Audio track		Hi-fi audio track (2-channel)	
	Normal audio track (monaural audio)	Either position	L	R
Regular broadcast (monaural audio)		Released SAP REC	Mono	Mono
Regular + SAP (Second audio program)		Pressed in SAP REC	Main audio (mono)	Main audio (mono)
Stereo + SAP (Second audio program)		Released SAP REC	Second audio (mono)	Main audio (mono)
Stereo broadcast		Pressed in SAP REC	L + R mixed	Stereo
		Released	Second audio	Stereo
		Either position	L + R mixed	Stereo

Note:

- Second audio programs cannot be recorded on the hi-fi audio track.

Hi-Fi audio recording level adjustment

While recording onto the normal audio track is controlled by the built-in Automatic Level Control (ALC) circuit, hi-fi audio recording has two control options: manual and automatic.

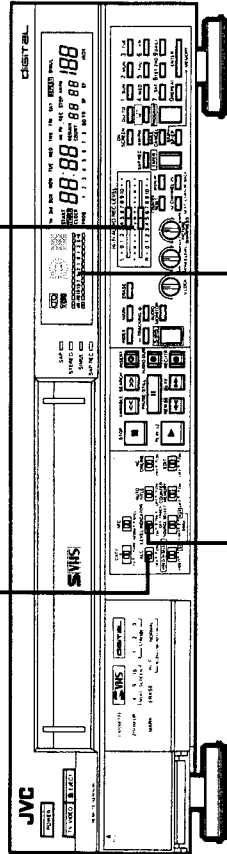


ALC switch

Setting this switch to ON activates the built-in audio limiter circuit for both channels so that the recording level is automatically controlled. For manual adjustment, set this switch to OFF. (The recording level for normal audio is always controlled automatically regardless of the setting of the switch.)

HI-FI AUDIO REC LEVEL controls

Slide these controls, the upper for left channel and the lower for right channel, for manual adjustment of the hi-fi audio recording level.



LEVEL INDICATOR switch

For manual control of the recording level, set this switch to ON so that the audio level indicators on the FDP will light.

Audio level indicators

For manual control of the recording level, first set the relevant switches as follows:

- ALC → OFF
- LEVEL INDICATOR → ON
- AUDIO MONITOR → HI-FI

Then slide the HI-FI AUDIO REC LEVEL controls referring to these indicators. When indicators up to or near 0 dB light for the loudest signal being received, the recording level is optimum. (The level at which only one red indicator lights from time to time may be most appropriate.) During playback, these indicators show the level of audio signals recorded on the tape and selected with the AUDIO MONITOR button.

If no signal is recorded on the hi-fi audio track, the level of normal audio is automatically indicated.

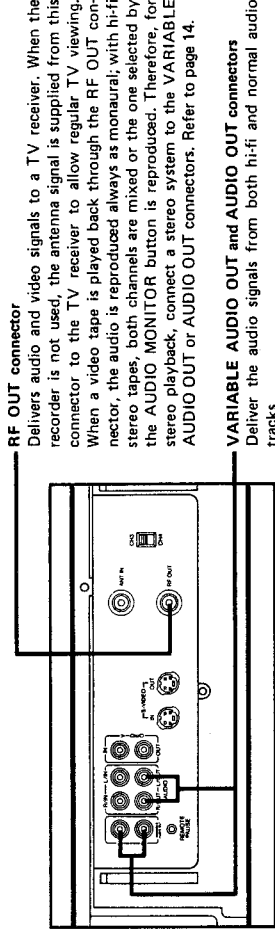
These indicators do not light when the LEVEL INDICATOR switch is in the OFF position.

Notes:

- With the AUDIO MONITOR select button in the NORMAL position, the recording level of hi-fi audio signals cannot be correctly indicated. Select the HI-FI position when adjusting the recording level.
- The normal audio signal level is also displayed by these indicators, but cannot be adjusted.

Dual-audio playback flexibility

Two different types of audio tracks (hi-fi and normal) allow a variety of playback options depending on the connection and the settings of relevant controls and switches.

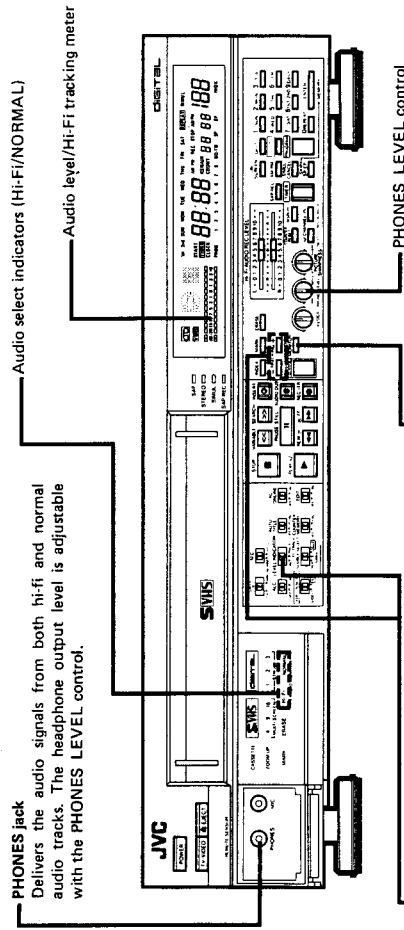


RF OUT connector

Delivers audio and video signals to a TV receiver. When the recorder is not used, the antenna signal is supplied from this connector to the TV receiver to allow regular TV viewing. When a video tape is played back through the RF OUT connector, the audio is reproduced always as monaural; with hi-fi stereo tapes, both channels are mixed or the one selected by the AUDIO MONITOR button is reproduced. Therefore, for stereo playback, connect a stereo system to the VARIABLE AUDIO OUT or AUDIO OUT connectors. Refer to page 14.

VARIABLE AUDIO OUT and AUDIO OUT connectors

Deliver the audio signals from both hi-fi and normal audio tracks.



PHONES jack

Delivers the audio signals from both hi-fi and normal audio tracks. The headphone output level is adjustable with the PHONES LEVEL control.

AUDIO select indicators (HI-FI/NORMAL)

Audio level/Hi-Fi tracking meter

LEVEL INDICATOR switch and TRACKING controls

The audio level indicators on the FDP show the audio signal level during recording and playback when the LEVEL INDICATOR switch is set to ON.

The right-channel audio level indicator also functions as a tracking meter during playback. If noise or breaks are sensed in the reproduced sound from the hi-fi audio track, attempt correction by using the TRACKING controls while referring to the meter. For this purpose, set the LEVEL INDICATOR switch to HI-FI TRACK and press either TRACKING control button so that the greatest number of elements of the right-channel indicator light.

When this switch is set to OFF, the indicators do not light; regardless of whether during recording or playback.

Note:

- When playing back a tape with no recording on the hi-fi audio track, the level indicator does not light when the LEVEL INDICATOR switch is set to HI-FI TRACK.

AUDIO MONITOR button

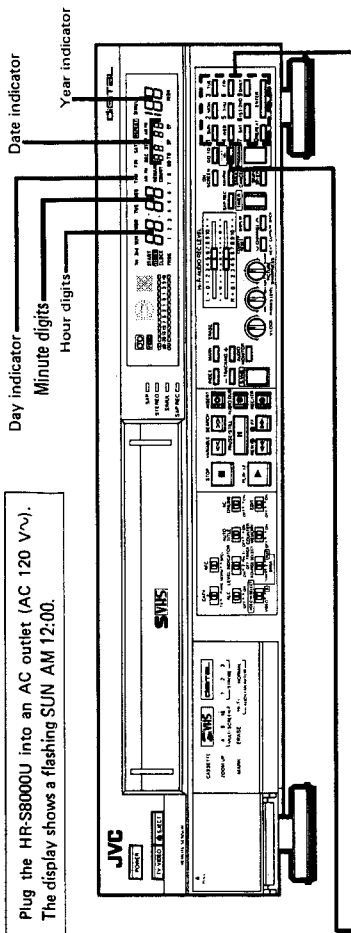
Selects the hi-fi stereo soundtrack, the normal soundtrack, or a mixture of the two for listening. Each time the button is pressed, the selected soundtrack changes in the order of hi-fi stereo, normal, mixed, and then back to hi-fi stereo and the corresponding audio select indicator will light. For mixed playback, both the HI-FI and NORMAL indicators will light.

- Set to HI-FI to listen to a stereo soundtrack.
- Set to NORMAL to listen to the normal sound.
- Set to HI-FI/NORMAL to listen to both.

Notes:

- This button functions during recording as well, although it has no effect on the recorded signal.
- When a tape with normal audio only is played back, the NORMAL mode is automatically selected.

Plug the HP-S8000U into an AC outlet (AC 120 V~). The display shows a flashing SUN AM 12:00.



1 Press CLOCK ADJ. The "CLOCK" indication and the indicated day will flash.

2 Press a numeric key corresponding to the day of the week.
• If the indicated day is OK, proceed to the next step.

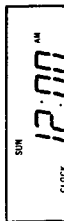
3 Press ENTER. The time display section will flash.

Notes:

- Clock setting must begin within 10 seconds of pressing the CLOCK ADJ button, otherwise it will be necessary to press the CLOCK ADJ button again.
- Clock setting is not possible if the TIMER button is engaged with the TIMER indicator lit. First check to see that the TIMER indicator is not lit.
- Steps 4 and 5 can be reversed.
- The NEXT and BACK keys can be used to switch from the day to time setting mode, or vice versa.
- Auto-titling (see page 25) will not function unless the time, date and year have been correctly set.
- Advance the minute digits slightly ahead of the exact time. Press the CLOCK ADJ button precisely when a time signal from broadcast or telephone is heard to insure accurate time setting.

Power failure indicator

The clock display may reset to SUN AM 12:00 and start to flicker. This is not a malfunctioning of the clock, but it indicates that there has been a power failure in excess of 60 minutes. Readjusting the time restores the normal condition of the clock display.



LOADING AND UNLOADING A CASSETTE

Loading

- Insert a cassette as illustrated with its labelled side facing you.
- With a cassette inserted, the (C) mark to indicate "cassette inserted" appears on the display panel. If you insert an S-VHS cassette, the S-VHS CASSETTE indicator will also light.



Unloading

Press the EJECT button. The cassette will be ejected.

Motorized loading system

- The cassette can be loaded even when the power has not been turned on. Inserting a cassette into the loading slot turns the power on automatically.
- The cassette can be unloaded even when the power has been turned off. If a cassette is inside, pressing the EJECT button turns the power on automatically and, after ejection of the cassette, shuts it off automatically.

BASIC OPERATION

- Inserting a cassette, with its safety tab removed, turns the recorder on and playback of the cassette begins automatically.
- Be sure to insert the cassette firmly into the slot; otherwise, it will be automatically ejected.
- The automatic loading mechanism will operate only when the cassette is inserted correctly.

Notes:

- Be sure to insert the cassette firmly into the slot; otherwise, it will be automatically ejected.
- The automatic loading mechanism will operate only when the cassette is inserted correctly.

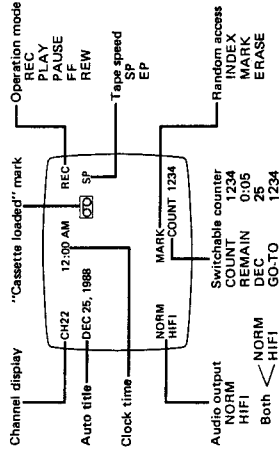
Caution

- If unloading of a cassette is not possible, check to see whether the TIMER indicator is lit. If so, press the TIMER button so the TIMER indicator extinguishes.
- Do not attempt to pull out the cassette once automatic loading has started.

Warning

- Do not insert fingers or any foreign object beyond the door flaps of the cassette loading slot, as this could lead to injury or damage to the mechanism. Show special caution with children.

ON-SCREEN CHANNEL, TIME AND MODE DISPLAY



Automatic indication

- Channel: Each time a different channel is selected, the number of that tuned-in channel is displayed on the TV screen for 5 seconds.
- Operation mode: Each time the operation mode is changed, that engaged mode is displayed. Displayed for 5 seconds together with channel, "cassette loaded" mark, and the tape speed (SP or EP).
- PLAY: Displayed only when the mode is changed from Stop to Play. (No indication appears when special effects are applied in the Play mode.)
- PAUSE: Remains displayed as long as the Record-Pause mode continues.
- FF/REW: Displayed for 5 seconds.
- "Cassette loaded" mark: In addition to being displayed together with "REC", the mark is displayed for 5 seconds when a cassette is inserted, and blinks until the cassette is ejected when the EJECT button is pressed.

- Audio output: When the audio output is changed by pressing the AUDIO MONITOR button, the engaged audio output mode is displayed for 5 seconds except during playback.
- Switchable counter: COUNT/REMAIN/ When the counter mode is changed, the same information as on the FDP is displayed for 5 seconds. When the Go-To mode is engaged, the same information as on the FDP appears and, upon completion of Go-To search, disappears after showing the last figure for 5 seconds.
- Random access: INDEX: Displayed when the Index Search mode is engaged. When the search number is specified by the numeric keys, this is also displayed until search spooling is initiated.
- MARK: Displayed when an index code is recorded (whether automatically or manually).
- ERASE: Displayed when the ERASE button is pressed.
- Auto title: When the AUTO TITLE switch is set to ON, this date indication together with the time and channel are all displayed and recorded for 5 seconds each time a new recording is started.

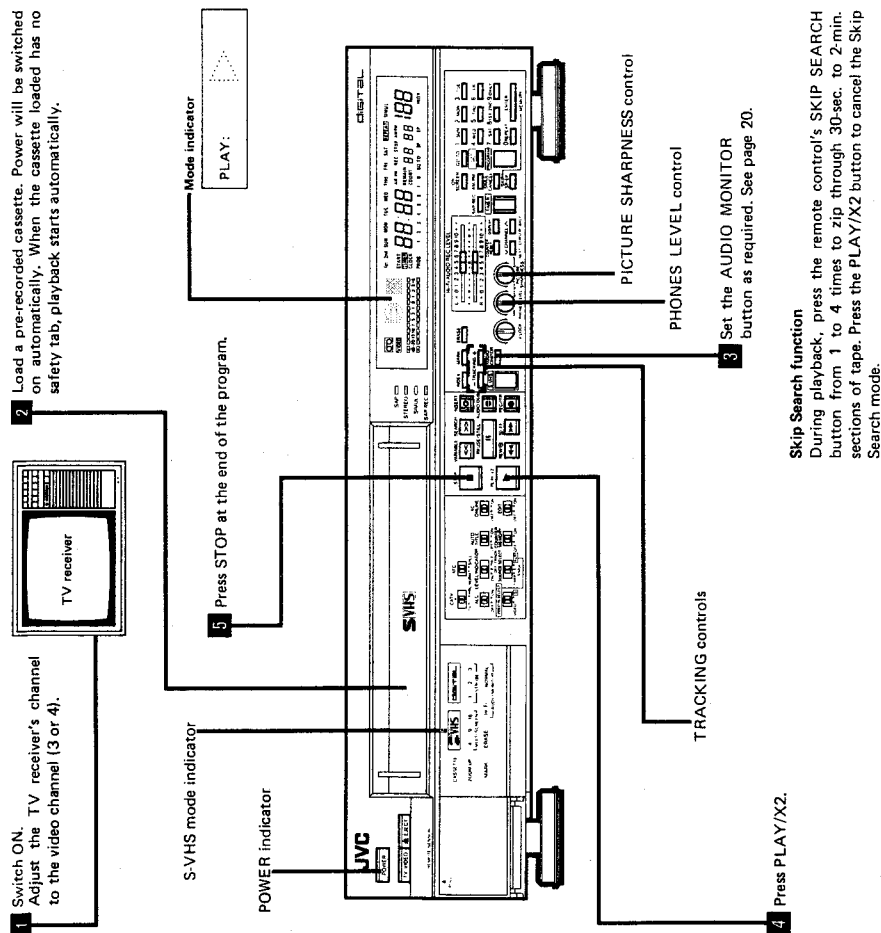
Manual recall/cancel

- For anytime checking of the recorder status, or time and date, press the ENTER button (on the recorder or remote control) or the ON SCREEN button (on the remote control). The corresponding indication will be available on the screen for 5 seconds.

Note:

- For on-screen timer programming, see page 37.

PLAYING BACK A VIDEO CASSETTE



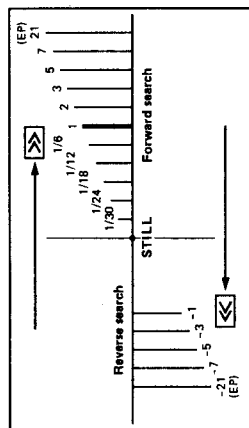
BASIC OPERATION

SPECIAL-EFFECTS PLAYBACK

When one of the following modes is engaged, the digital circuitry is automatically activated to help compensate for picture quality deterioration. Therefore, stills, slow-motion and fast-motion pictures are all cleaner than before. The "DIGITAL" indicator will remain lit while in these modes.

VARIABLE SEARCH buttons

- To search in the forward direction, press the $\gg$ button in the Play mode; slow-motion playback at 1/30 the normal speed is engaged.
- To increase the speed (to 1/24, 1/18, 1/12, 1/6, normal, 2X, 3X, 5X and 7X), press the $\gg$ button; to decrease the speed, press the $\ll$ button. Pressing the $\ll$ button from 1/30, the direction changes to reverse search.
- To search in the reverse direction, press the $\ll$ button in the Play mode. Reverse playback at normal speed is engaged.
- To increase the speed, press the $\ll$ button; to decrease the speed, press the $\gg$ button. Pressing this $\gg$ button from normal speed changes the direction to forward search.



Mode indicator

FF:	STILL:
REW:	SLOW:
FF SHUTTLE SEARCH:	REW SHUTTLE SEARCH:

V. LOCK control

High-speed forward search

FF button

- To fast forward the tape, press this button in the Stop mode.
- To shuttle search the tape in the forward direction, press this button in the Play mode.
- The shuttling speed is about 7 times normal in the SP mode and 21 times normal in the EP mode.
- Press the PLAY/X2 button to return to normal playback.

Still playback

PAUSE/STILL button

- Press while in the Play mode; the tape will stop and a still picture will be obtained.
- To advance the still picture, press again.
- To return to the normal Play mode, press the PLAY/X2 button.

High-speed reverse search

REW button

- To rewind the tape, press this button in the Stop mode.
- To shuttle search the tape in the reverse direction, press this button in the Play mode.
- The shuttling speed is about 7 times normal in the SP mode and 21 times normal in the EP mode.
- Press the PLAY/X2 button to return to normal playback.

Double-speed playback

PLAY/X2 button

- Press while in the Play mode; double-speed playback will be engaged.
- To resume normal playback, press the same button again.

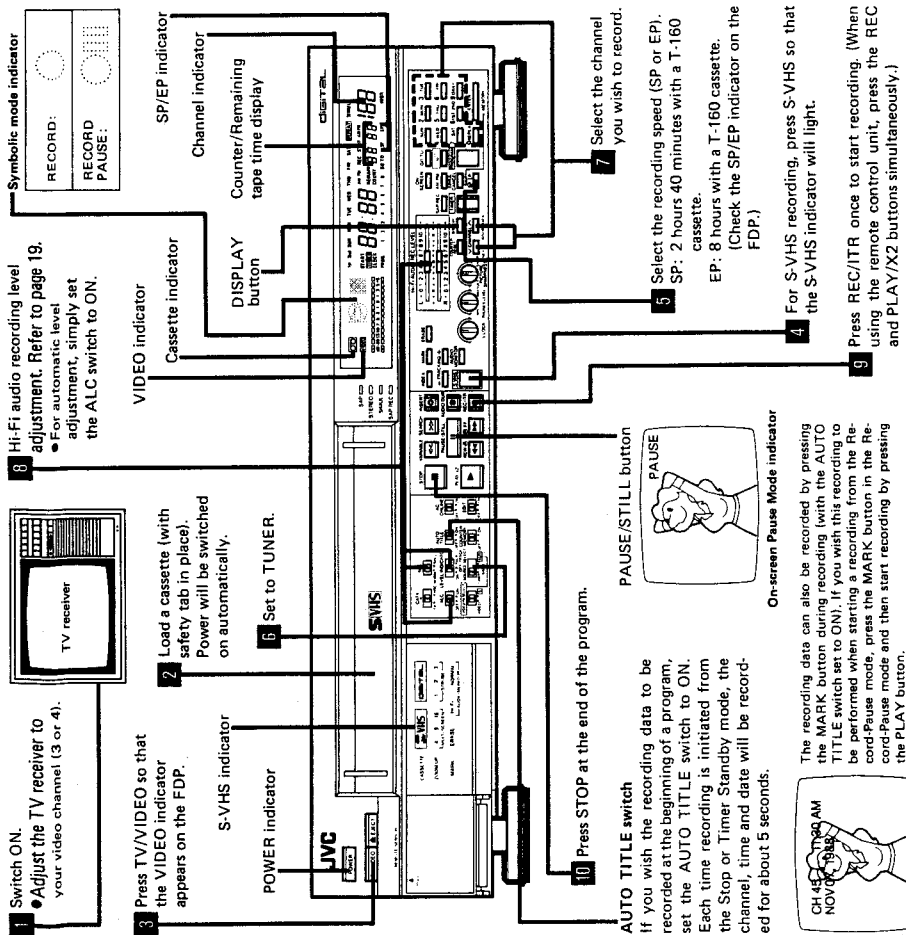
Notes:

- For briefer scanning, keep the REW or FF button pressed for more than 2 seconds; when you release the button, the search mode will be cancelled. In this case, the shuttling speed in the EP mode is about 7 times normal.
- When the Still mode continues for longer than about 5 minutes, the Stop mode will be entered automatically.
- With some televisions, the still picture may be unstable. If vertical vibration of the picture is observed, attempt to correct it by turning the V. LOCK control.
- If noise bars are visible, use the TRACKING controls as described on the previous page.

Notes:

- The SP/EP button may be in either position. The SP, LP or EP mode recording is automatically detected and played back at the correct speed.
- Irrespective of the S-VHS mode button setting, the S-VHS or VHS recording mode is automatically detected and played back in the correct mode. The S-VHS mode indicator lights for playback of S-VHS recordings.
- When the PLAY/X2 button is pressed to start playback, the VIDEO mode is automatically entered and the VIDEO indicator on the FDP lights.
- The tape-end auto rewind mechanism functions in the Play, Fast Forward and Variable Search modes.
- Noise bars may appear on the screen if you play back a tape which was recorded using another recorder. In such cases, adjust the TRACKING controls. Press one of the buttons until a satisfactory picture is obtained. After playback, tracking may be reset manually by pressing both buttons simultaneously. It is reset automatically when the tape is ejected or the power turned off.
- Images on the screen can be adjusted to a preferred softer or sharper definition by turning the PICTURE SHARPNESS control.
- When listening through headphones, if the volume is too low or too high, adjust the PHONES LEVEL control for comfortable listening.

BASIC OPERATION FOR RECORDING TV PROGRAMS

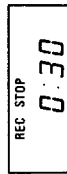


BASIC OPERATION

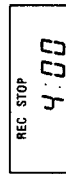
INSTANT TIMER RECORDING

After you start recording, the recorder can be set to stop automatically after a certain period of time. Use this facility for starting a recording before you go to bed or leave home.

- 1 Press REC/ITR while recording (or twice if in the Stop mode).
• The following indication will appear on the display, to show that the recorder is recording in the Instant Timer Recording mode and power will switch off after 30 minutes.



- 2 Each time the REC/ITR button is pressed, recording time increases by 30 minutes to a maximum of 4 hours. If the REC/ITR button is pressed again, the Normal Recording mode will be entered.



- For a more precise time setting, use the numeric keys to set to the exact time required.
- 1. After "0:30" has appeared, specify the time using the numeric keys.
- Always key in a full number including hours and minutes.
- 2. Press the REC/ITR button immediately (within 4 seconds).

Notes:

- Time setting in the Instant Timer Recording mode is possible up to a maximum of 8 hours 59 minutes if the numeric keys are used.
- While recording is in progress, the displayed time counts down; when 0:00 is reached, the Record mode is released after 10 seconds and the power is switched off.
- If you want to stop recording after having started recording in the Instant Timer Recording mode, press the STOP button.
- If instant timer recording is engaged while the unit is in the Pause mode, the timer will count down normally, but recording will not begin until the PLAY/X2 button is pressed.
- When the Instant Timer Record-Pause mode continues for longer than about 5 minutes, the mode is released and the power is switched off.
- If you want to check the Remaining tape time or Counter reading while performing instant timer recording, press the DISPLAY button to obtain the desired indication (the REC STOP indication disappears). To return to the REC STOP indication, press the REC/ITR button once, or wait for about 5 seconds and the remaining time indication will reappear automatically.

RECORDING ONE TV PROGRAM WHILE WATCHING ANOTHER

A program not being viewed can be recorded while you enjoy another program. This permits the recorded program to be played back later at your convenience.

The recording procedure is exactly the same as described on the previous page. The points to be remembered are:

- Select the channel you wish to record with the recorder's channel select buttons.
- Select the channel you wish to view with the TV receiver's channel selector.
- Make sure that the VIDEO indicator is not lit on the FDP. If lit, press the TV/VIDEO button so that it extinguishes.

RECORDING STEREO TV PROGRAMS

When stereo TV programs are broadcast, the HR-S8000U is capable of automatically receiving them in stereo. When a stereo program is being received, the STEREO indicator lights and recording is made in stereo on the hi-fi audio track and in monaural on the normal audio track. To listen to the stereo soundtrack during recording, set the AUDIO MONITOR select button to Hi-Fi (the Hi-Fi indicator lights).

RECORDING SAP (Second Audio Program) TV PROGRAMS

When an SAP TV program is being received, the SAP indicator lights. To record such a program, pay attention to two additional controls and the basic operation described on the previous page.

- Press the SAP REC button so that the SAP REC indicator lights, to record the second audio program. To record the main audio program only, release this button (the SAP REC indicator is off).
- Set the AUDIO MONITOR select button to NORMAL (the NORMAL indicator lights) to listen to the SAP soundtrack being recorded.

Note:

- SAP programs can be recorded only on the normal audio track. It is not possible to record any SAP program on the hi-fi audio track, regardless of the setting of any switch.

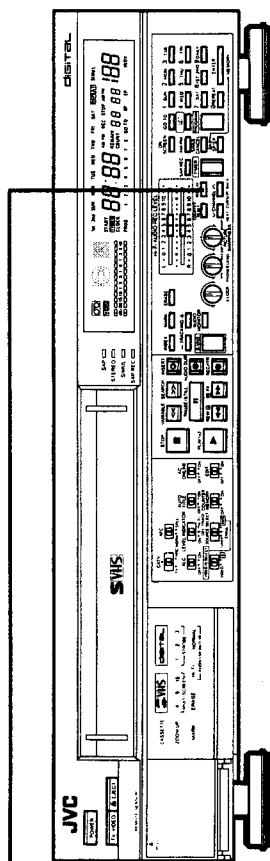
CONVENIENT FACILITIES

REMAINING TAPE TIME INDICATOR

The tape counter is switchable to the remaining tape time indicator.

- 1 Press the DISPLAY button to obtain the Remaining Tape Time mode.

- 2 The remaining tape length will be shown in hours and minutes.



Notes:

- During recording, the remaining tape length is calculated in reference to the recording mode selected by the SP/EP button; during playback, it is calculated in reference to the recording mode of the tape being played (SP/EP).

- The indicated remaining time is approximate. The time required to calculate the remaining tape length and the accuracy of that calculation may vary according to the type of cassette tape. (The remaining time indication is not available if this mode is engaged from Fast Forward or Rewind.)

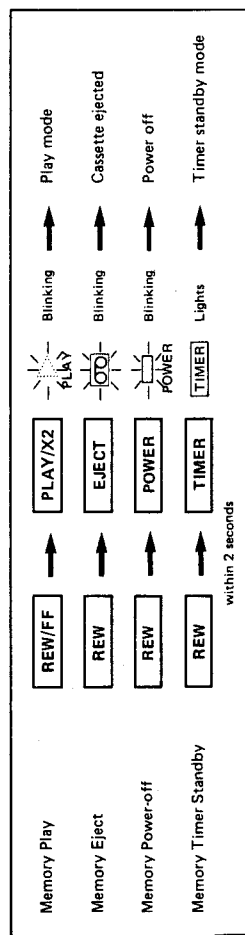
NEXT-FUNCTION MEMORY

Memory Play function

- If you want to watch the tape from its beginning after rewinding, press the REW button and then PLAY/X2 within 2 seconds. Playback will start automatically at the beginning of the tape. (The COUNTER MEMORY switch must be in the OFF position.)
- If you want to watch the tape from the counter reading of "0000", shift the COUNTER MEMORY switch to the ON position. Then press the REW (or FF) button and then PLAY/X2 within 2 seconds.
- While the tape is being rewound, the PLAY indicator is blinking. To cancel the Memory Play mode and go to another mode, press the corresponding button (STOP, PLAY/X2, FF, REW).

Memory Eject/Power-Off/Timer Standby

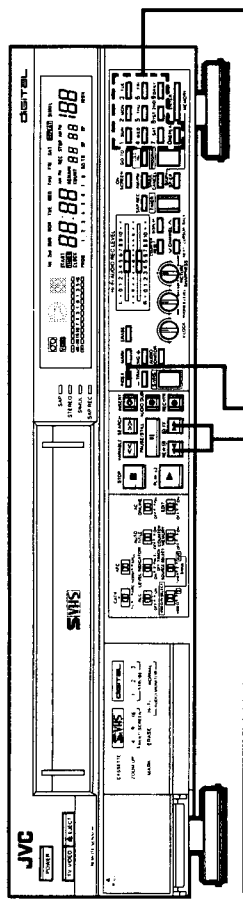
- If you are going to eject the cassette, turn the power off or engage the Timer Standby mode after rewinding the tape; you do not have to wait for completion of rewind to press the corresponding button.
- To eject the cassette after rewind, press REW and then EJECT within 2 seconds. (To cancel the Memory Eject mode, press STOP.)
- To turn the power off after rewind press REW and then POWER within 2 seconds. (To cancel the Memory Power-off mode, press POWER.)
- To engage the Timer Standby mode after rewind, press REW and then TIMER within 2 seconds. (To cancel the Memory Timer Standby mode, press TIMER.)



INDEX SEARCH FUNCTION

The Index Search function gives you automatic access to the beginning of individual recordings, and to index codes placed by you within those recordings. With the HR-S8000U, you can access any one of up to 9 of these indexed segments in either the forward or reverse direction.

Using the Index Search function



- 3 Press either FF or REW within 2 seconds.

- The tape will move and the index numbers count down to 0, where normal playback will start.
- If the INDEX button was pressed in the Play mode, the screen shows search pictures; if the button was pressed in the Stop mode, the index codes are detected in the Rewind or Fast-Forward mode.

- 2 Specify the index number using one of the numeric keys.

- The specified number will appear in the FDP.

- 1 Press the INDEX button (on the recorder or remote control) while in the Play or Stop mode.

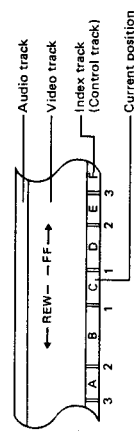
- The channel display of the FDP will change to the Index Search mode.

- If the end of the tape is reached while still in the Index Search mode, the mode is cancelled and the tape rewound.

Notes:

- To cancel the Index Search mode before completion, press the PLAY/X2 or STOP button.

Tips for specifying the index number



- "1" + FF moves playback to the beginning of segment D.
- "1" + REW moves playback to the beginning of segment C.
- "2" + REW moves playback to the beginning of segment B.
- If no number is entered, a value of "1" is assumed.

Changing the index codes

Index codes are automatically placed at the beginning of recordings which are started from the Stop or Timer mode.

You can use the MARK button to add extra codes, and the ERASE button to erase codes. In neither case is there any effect on the audio or video recordings on the tape.

MARK

In the Play or Record mode, press this button once to put an index code onto the tape.

The LED blinks during the marking process.

ERASE

In the Play or Still mode, press this button to erase the next index code. First the Shuttle Search mode will be engaged and, when an index code is detected, it will be erased automatically. Then the Erase mode is cancelled and playback resumes.

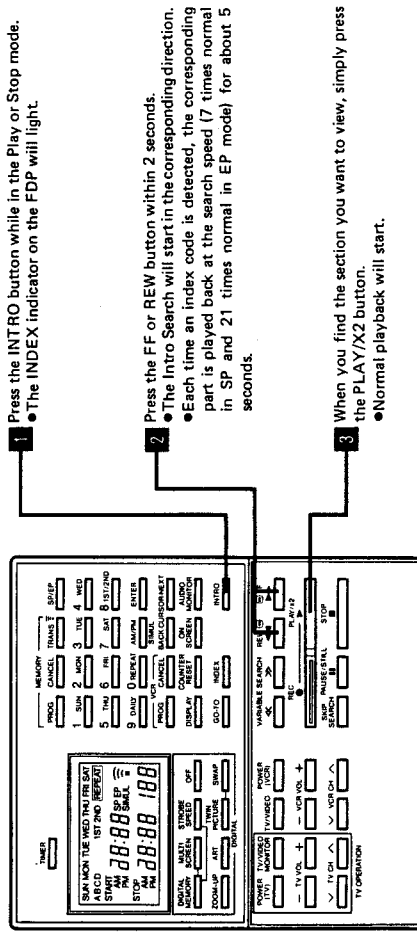
The LED remains lit during the erasing process and blinks during the erasing process.

Notes:

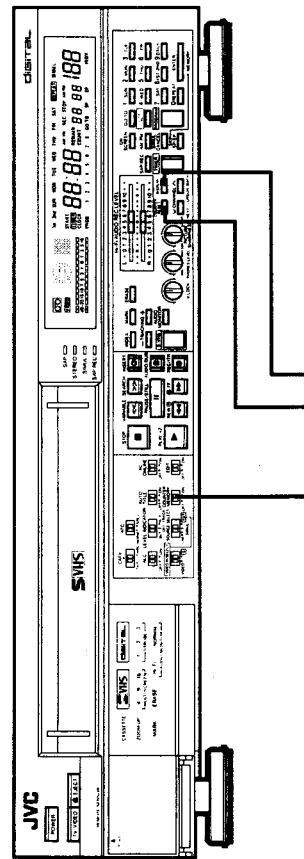
- If the AUTO TITLE switch is set to ON, both the index code and the recording data will be recorded by pressing the MARK button.
- The index codes on a tape with its safety tab removed cannot be changed.
- While the index code is being searched for in the Erase mode, random noise appears on the screen.
- Changing the index codes in the vicinity of switching points between SP and EP recordings will distort the pictures.

INTRO SEARCH FUNCTION

The Intro Search function lets you visually check the contents of each recording by playing back in fast motion a short segment of a program each time an index code is detected.



COUNTER MEMORY FUNCTION

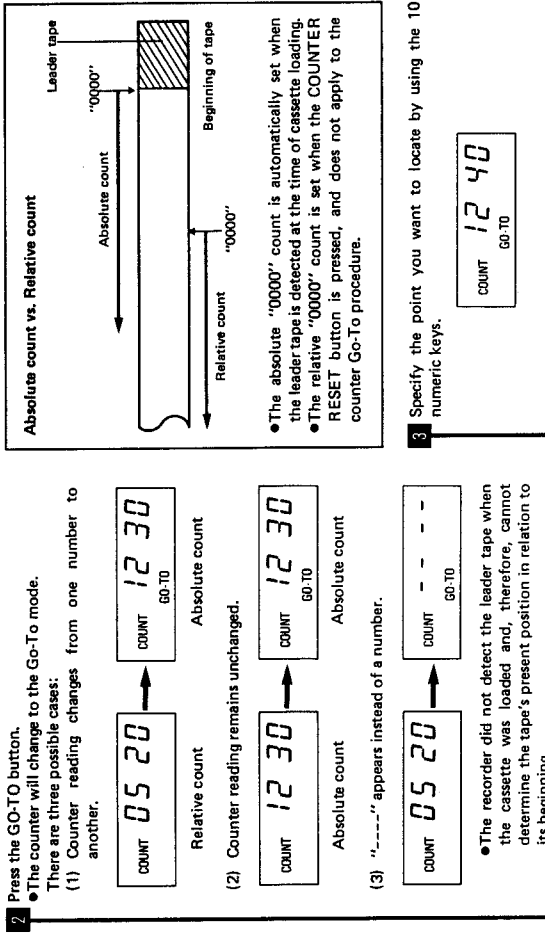


Counter Memory function

1. Press the DISPLAY button to obtain the Counter mode.
 2. Press the COUNTER RESET button at a point which you may wish to locate later.
 3. The tape counter will indicate "0000".
 4. Set the COUNTER MEMORY switch to ON.
 5. Press the REW (or FF) button when you need to return to the designated point.
- The tape will rewind (or fast forward) and stop at about the "0000" counter reading automatically.

COUNTER GO-TO FUNCTION

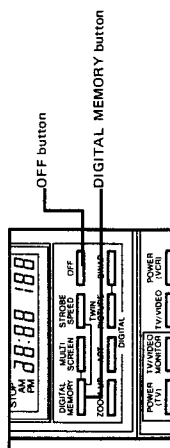
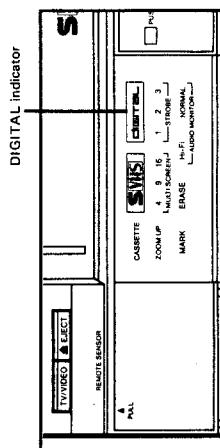
The counter Go-To function gives you direct access to any point on the tape by simply specifying a desired counter reading. Depending on your command, the tape will either stop at the point or playback will start automatically from there.



DIGITAL FUNCTIONS

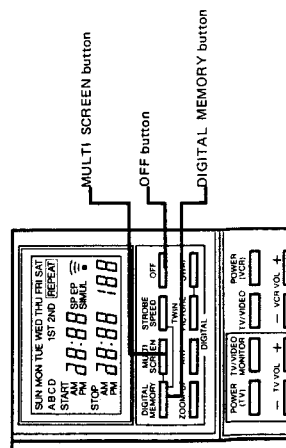
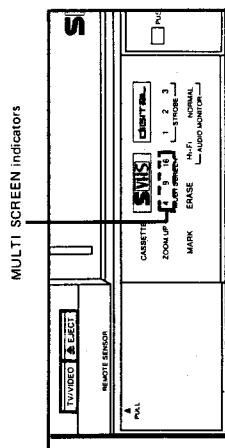
The HR-S8000U incorporates digital memory circuits to provide a variety of special effects during recording, and while watching a recorded tape or a regular television broadcast.

DIGITAL FREEZE FUNCTION



MULTI-SCREEN DIGITAL FREEZE FUNCTION

Multi-Screen Digital Freeze:
Selected still pictures are displayed on split screens.



Note:

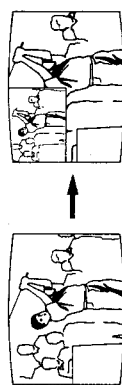
To use the HR-S8000U as a special-effects generator while watching television, engage the HR-S8000U in the VIDEO mode, set the TV receiver to your video channel and select the channel you wish to view with the HR-S8000U's channel selector.

Digital Freeze:

A still picture stored in memory is continuously reproduced on the TV screen while the tape runs or a regular broadcast continues. The soundtrack is not affected. If this mode is engaged during recording, the frozen picture will be continuously recorded.

- While in the Play or Record mode (or while viewing a television program), press the DIGITAL MEMORY button.
- The picture is "frozen" on the screen at the instant of pressing.
- The soundtrack continues unaffected.
- The "DIGITAL" indicator will light.
- To switch to another still picture, press the DIGITAL MEMORY button again.
- To restore normal pictures, press the OFF button.

- While in the Play or Record mode (or while viewing a television program), press the MULTI SCREEN button to select the desired Multi Screen mode.
- The first pressing engages the 4-screen mode, then each subsequent pressing changes the number of sub-screens to 9 and 16. Pressing once again cancels the Multi-Screen mode.
- The corresponding MULTI SCREEN indicator will light.
- Press the DIGITAL MEMORY button.
- The picture will be frozen and the ongoing program will continue in a sub-screen appearing in the upper left corner.
- The "DIGITAL" indicator will light.



- Each time the DIGITAL MEMORY button is pressed, still pictures will fill the subsequent sub-screens.
- When the last sub-screen is frozen by pressing the DIGITAL MEMORY button, the program will continue in the first sub-screen and another cycle of selecting still pictures for each of the sub-screens can be performed.



- To restore normal pictures, press the OFF button.

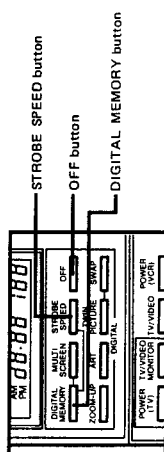
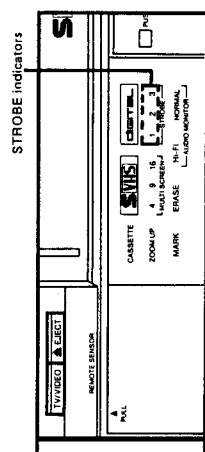
Note:

The images on the screen will become distorted if you change the channel while remaining in the Multi-Screen Digital Freeze mode.

DIGITAL STROBE FUNCTION

Digital Strobe:

A still picture selected at regular intervals from the tape or broadcast and stored in memory is continuously reproduced on the screen while the tape or broadcast continues with its soundtrack unaffected. The regular changing of the stored picture results in a strobe-light or time-lapse effect. Strobing at three different speeds can be selected. When applied during recording, the strobing pictures will be recorded.



- The selected speed will be indicated by one of the STROBE indicators.
- After speed 3, a still picture is maintained as in the Digital Freeze mode.
- Press the DIGITAL MEMORY button while in the Play mode for while watching a television program.
- Strobing will start at the selected speed.
- The "DIGITAL" indicator will light.
- To change the strobe speed, press the STROBE SPEED button the required number of times.
- To restore normal pictures, press the OFF button.

Note:

It is also possible to perform strobing by first engaging the Digital Freeze mode and then selecting the speed.

DIGITAL FUNCTIONS



- While in the Play or Record mode (or while watching a television program), press the MULTI SCREEN button to select the desired Multi Screen mode.
- The corresponding MULTI SCREEN indicator (4, 9 or 16) will light.
- Press the STROBE SPEED button.
- Press the DIGITAL MEMORY button to start strobing.
- The still picture coinciding with the pressing of the button will be displayed on sub-screens and those sub-screens will be filled with different still pictures automatically at a constant speed.
- The "DIGITAL" indicator will light.
- After all sub-screens have been filled with still pictures, the screen remains unchanged.
- To restart strobing, press the DIGITAL MEMORY button; the first pressing changes the picture on the first (upper left-corner) sub-screen into a normal moving picture, and the second pressing starts strobing.
- To restore normal pictures, press the OFF button.

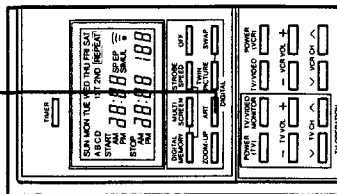
Note:

Once the DIGITAL MEMORY button has been pressed, it is not possible to alter the number of screens. The images on the screen will become distorted if you change the channel in the middle of strobing. To change the channel, first cancel the digital mode by pressing the OFF button.

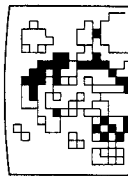
DIGITAL ART EFFECTS

Mosaic effects:

Reproduces the image with square patterns. Two different patterns are available.



Mosaic 1
A pattern of smaller squares



Mosaic 2
A pattern of larger squares

Solarization effects:

Solarizes the color of the image as with a paintbrush.



Solarization 1
Stronger solarization



Solarization 2
Weaker solarization

Press the ART button while in the Play or Record mode (or while watching a television program).

- Each time the ART button is pressed, the mode changes in the order of Mosaic 1, 2, Solarization 1, 2 and then returns to Mosaic 1.

The "DIGITAL" indicator will light.

Press the OFF button to restore normal pictures.

Notes:

- The Digital Art function can also be used in combination with the following functions:
 - Digital Freeze
 - Digital Strobe

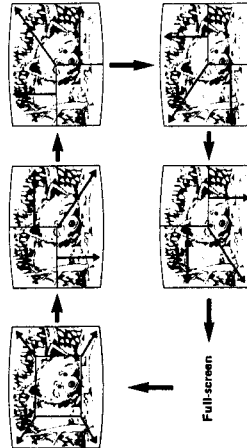
DIGITAL ZOOM FUNCTION

Digital Zoom:

Enlarges the desired quarter of the picture on the screen to a full-screen picture. The displayed pictures are moving pictures.

Press the ZOOM UP button while in the Play or Record mode (or while viewing a television program).

- The center quarter of the picture will be enlarged to full-screen size.
- Each time the ZOOM UP button is pressed, the position of the quarter to be enlarged changes in the order as shown below:



Full-screen

While in the Digital Zoom mode, the ZOOM UP and

DIGITAL indicators remain lit.

Notes:

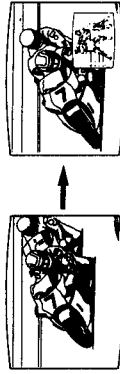
- In the Digital Zoom mode, the picture may become slightly more grainy or it may look split into upper and lower halves.
- With some televisions, the zoomed-up picture may not completely fill the entire screen. This is not due to any defect of the unit.

PICTURE-IN-PICTURE AND SWAP FUNCTIONS

Picture-In-Picture:

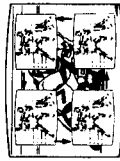
During tape playback, a TV broadcast received by the VCR's built-in tuner is displayed in an inset window.

- While in the Play mode, press the TWIN PICTURE button.
- A sub-screen corresponding to the size of the 9-screen mode will appear in the lower right-hand corner and show a program from the selected channel of the VCR's tuner.



The "DIGITAL" indicator will light.

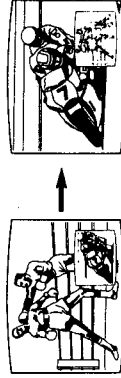
- Each pressing of the TWIN PICTURE button shifts the position of the window as follows:



Swap function:

The swap function allows the switching of pictures between the main screen and window.

- To switch pictures between the main screen and window, press the SWAP button.



- To restore normal playback pictures, press the OFF button.

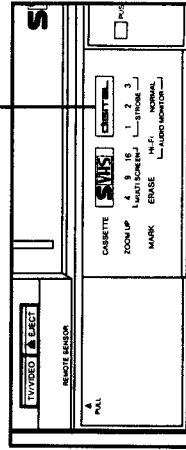
Notes:

- With some televisions, the position of the window could be such that its edge exceeds the frame of the main screen.
- If the reception quality of the TV program on the main screen is inferior, the picture in the window may not be normal.
- If the program on the main screen is monochrome, the picture in the window will also be monochrome.

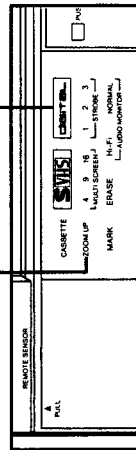
DIGITAL FUNCTIONS

- To view another program in the window, select a different channel on the VCR.
- If an external source is selected, this can be displayed as well.

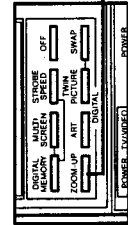
DIGITAL indicator



ZOOM UP indicator

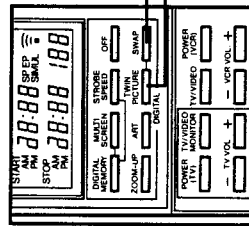


ZOOM UP button



SWAP button

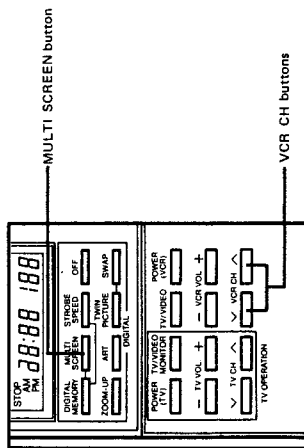
TWIN PICTURE button



MULTI-SCREEN CHANNEL SCAN FUNCTION

Multi-Screen Channel Scan:

Broadcast programs are displayed as still pictures on sub-screens as channel scanning proceeds. This multi-screen picture cannot be recorded.

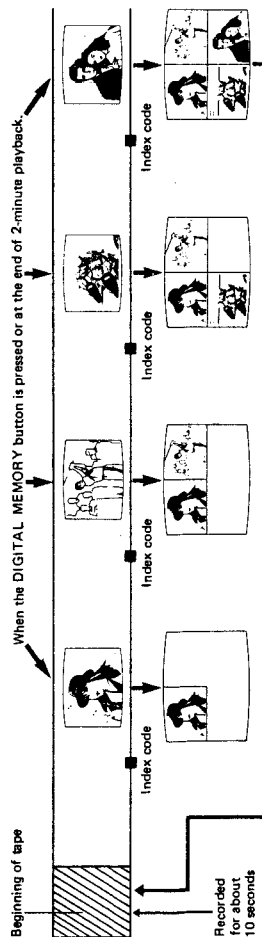


MULTI-SCREEN INTRO SEARCH FUNCTION

Multi-Screen Intro Search:

Using the Multi Screen mode and the Index Search function, displays the still pictures located at detected index codes and, after completion of the search, records the multi-screen image at the beginning of the tape.

- Press the MULTI SCREEN button to select the desired Multi Screen mode (4, 9 or 16).
- Always start Intro Search from the beginning of the tape.
- Press the INTRO button.
- Press the FF button.
- When an index code is detected, playback starts automatically and continues for about 2 minutes.
- Intro Search in the reverse direction is not possible.
- Press the DIGITAL MEMORY button while playback continues.
- The picture coinciding with the pressing of the button is displayed on the upper left-hand corner sub-screen.
- If the DIGITAL MEMORY button is not pressed, the last picture of the 2-minute playback remains displayed on the sub-screen as a still picture.
- Then the Fast-Forward mode is automatically engaged to detect the next index code.



TIMER RECORDING

AUTOMATIC TIMER RECORDING

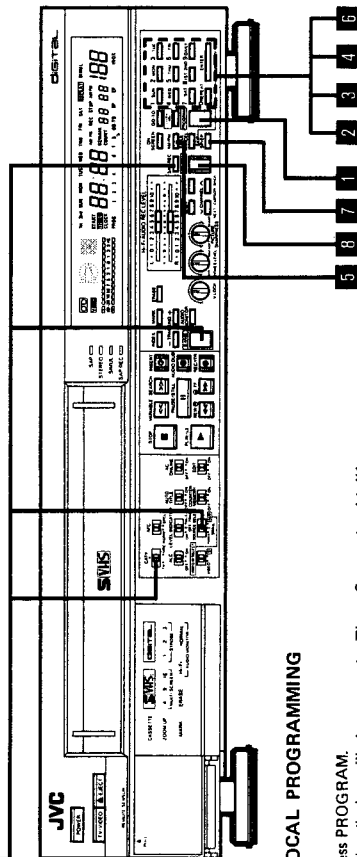
The built-in 14-day/8-event programmable timer permits recording of preset channels on preset days at preset times for preset lengths while you are away.



First of all, load a cassette (with safety tab in place); power will be switched on automatically.

Make sure of the settings of these switches:

- SOURCE SELECT: TUNER (or SIMUL) As required.
- SAP REC: As required.
- TV/CATV/HRC: As required.
- S-VHS: As required.



A. LOCAL PROGRAMMING

- Press PROGRAM.
- The display will change to the Timer Set mode with "1st SUN" ②, ③ blinking and program number "1" ① displayed. You are ready to enter the data into No. 1 program memory. To change the program number, press the PROGRAM button the required number of times.
- Key in the day ③; and press ENTER.
- To set for the 2nd week, press ② either before or after setting the day.
- To set for weekly serial recording ④, press ④.
- To set for daily serial recording, press ③.
- Key in the start time ⑤ and press ENTER.
- To specify AM or PM, press AM/PM/SIMUL either before or after setting the time.
- Invalid time numbers will be rejected (see page 39).
- Key in the stop time ⑥ and press ENTER.
- Specify AM or PM in the same way for the start time.
- To program FM simulcast recording, press AM/PM/SIMUL to call up "SIMUL" ⑦.
- Key in the channel number ⑧ and press ENTER.
- Invalid channel numbers will be rejected.
- Specify the recording speed ⑨ by pressing SP/EP and press ENTER.

- Now you can advance to the next program, if necessary, by pressing the PROGRAM button.
- After all necessary programs have been preset, proceed to the next step.

Three ways to perform timer programming

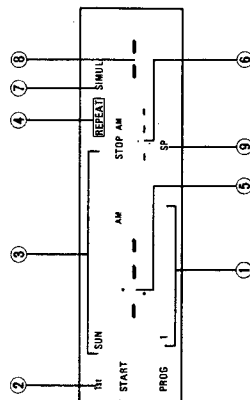
- Local programming:** Program the timer using the recorder's controls while referring to the recorder's FDP.
- Direct remote programming:** Program the timer using the remote control's keys while referring to the on-screen display.
- Independent remote programming:** Program the remote control's memory using the remote control's keys while referring to its own LCD and then transfer the data to the recorder.

Basic steps in programming

- Data input is possible where the cursor (blinking position) is located.
- Set the data and press the ENTER button; the data will be stored in memory.

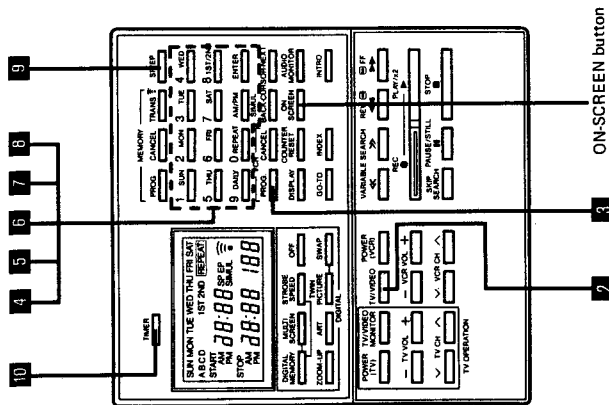
TIMER RECORDING

FDP



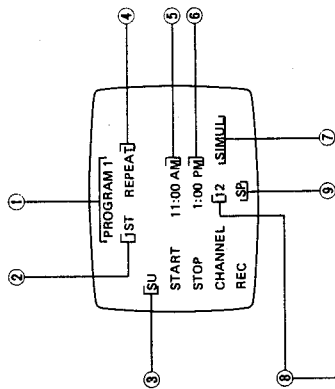
- Press TIMER.
- The TIMER indicator will light. (For error indications, see page 39).
- The display will return to the Clock mode, also showing the program numbers for which recording data has been programmed.

B. DIRECT ON-SCREEN REMOTE PROGRAMMING



ON-SCREEN display

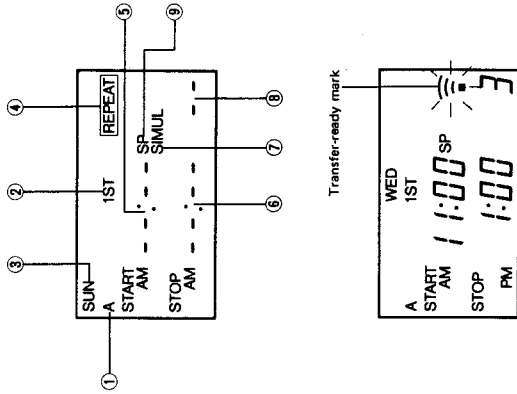
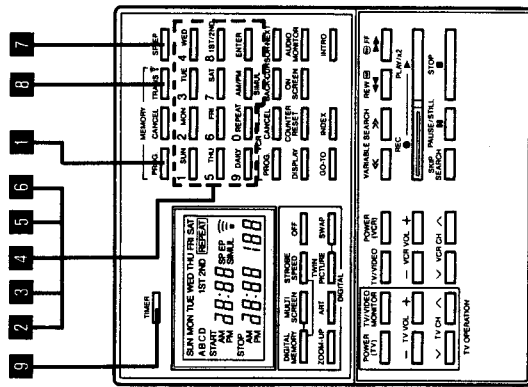
ON-SCREEN



"TU OFF" appears when the SOURCE SELECT switch is set to AUX; channel setting is not possible.

C. INDEPENDENT LCD REMOTE PROGRAMMING

- The remote control incorporates 4 program memories: A, B, C and D. These are independent of the VCR's timer memories 1 to 8.



- These 4 programs can be pre-programmed and held in memory. When transferred to the VCR memories, they are effective in controlling the VCR's starting and stopping.

- Turn on the TV receiver and set to your video channel (3 or 4).
- Press the TV/VIDEO button to engage the VIDEO mode.
- Press VCR PROG.
- The picture on the TV screen will change to the On-Screen Timer Set mode with "1ST SU" ② blinking and "PROGRAM 1" ① displayed. You are ready to enter the data into No. 1 program memory. To change the program number, press the VCR PROG. button the required number of times.
- To cancel the On-Screen Timer Set mode in the middle of timer programming, press the ON SCREEN button.
- Pressing the ON SCREEN button again, calls up the on-screen display.
- Key in the day ③; and press ENTER.
- To set for the 2nd week, press ② either before or after setting the day.
- To set for weekly serial recording ④, press ④.
- To set for daily serial recording, press ③.
- Key in the start time ⑤ and press ENTER.
- To specify AM or PM, press AM/PM/SIMUL either before or after setting the time.
- Invalid time numbers will be rejected (see page 39).

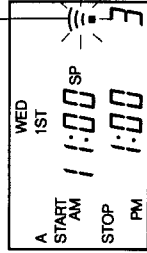
- Key in the stop time ⑥ and press ENTER.
- Specify AM or PM in the same way for the start time.
- To program FM simulcast recording, press AM/PM/SIMUL to call up "SIMUL" ⑦.
- Key in the channel numbers ⑧ and press ENTER.
- Invalid channel numbers will be rejected.
- Specify the recording speed ⑨ by pressing SP/EP and press ENTER.
- Now you can advance to the next program, if necessary, by pressing the VCR PROG. button.
- After all necessary programs have been preset, proceed to the next step.
- Press TIMER.
- The TIMER indicator will light. (For error indications, see page 39.)
- The display will return to the TV picture.

- Press MEMORY PROG.
- The LCD will be activated for program "A" ①, with "1ST SUN" ② ③ blinking.
- To advance to programs B, C or D, press again.
- Key in the day ③; and press ENTER.
- To set for the 2nd week, press ② either before or after setting the day.
- To set for daily serial recording ④, press ④.
- To set for weekly serial recording, press ③.
- Key in the start time ⑤ and press ENTER.
- To specify AM or PM, press AM/PM/SIMUL either before or after setting the time.
- Invalid time numbers will be rejected (see next page).
- Key in the stop time ⑥ and press ENTER.
- Specify AM or PM in the same way for the start time.
- To program FM simulcast recording, press AM/PM/SIMUL to call up "SIMUL" ⑦.
- Key in the channel number ⑧ and press ENTER.
- Invalid channel numbers will be rejected.
- Specify the recording speed ⑨ by pressing SP/EP, and press ENTER.
- After all program items have been set, the "transfer-ready" mark will appear and blink.

TIMER RECORDING

TIMER RECORDING

- Direct the remote control to the recorder's REMOTE SENSOR window and press MEMORY TRANS.
- The programmed data will be loaded in one of the VCR's memories (1 - 8), the vacant one of the smallest number.
- If all program memories are full, the VCR's clock display will blink and transmission will not take place.
- When this happens, check the VCR's memories on-screen and cancel unnecessary programs. For this purpose, press the VCR PROG. button to call up the on-screen display and check programs one after another. When a program that you do not wish to keep is reached, cancel it by pressing the VCR CANCEL button.
- After having cleared the VCR's program memory, transfer the data once again. If the LCD goes out, press the MEMORY PROG. button to call up the desired program and, after making sure that the transfer-ready mark is blinking, press the MEMORY TRANS button.
- Press TIMER.
- The TIMER indicator on the FDP will light. (For error indications, see next page)



Transfer-ready mark

IMPORTANT INFORMATION ON TIMER RECORDING

Concept of "week"

- The 1st week or 2nd week do not refer to weeks on the calendar; the 1st week refers to the seven-day period from the present day and the 2nd week, to the following seven-day period. These two weeks are counted from the time of setting.

If the current day and time of setting are Wednesday, 8:00 PM:



Variety of day setting possibilities

Setting	Procedure
One day of the 1st or 2nd week.	Numeric keys "1" - "7" and "0" for 2nd.
Weekly serial from the 1st week.	Numeric keys "1" - "7" and "0" for REPEAT.
Weekly serial from the 2nd week.	Numeric keys "1" - "7" and "0" for 2nd, and "0" for REPEAT.
Daily serial (SUN through SAT) for one week or every week.	Numeric key "9" for all days.
Daily serial (MON through SAT) for one week or every week.	Press once to obtain SUN through SAT.
Daily serial (MON through FRI) for one week or every week.	Press again for MON through SAT.
	"REPEAT" appears automatically with these indications:
	For daily serial recording only for one week, cancel "REPEAT" with numeric key "0".

Setting the timer

- Enter the data while the corresponding indication is flashing (about 60 seconds). If no command is entered within one minute, the display will return to the Clock mode.
- It is not possible to set the start and stop times unless the clock time has previously been set.
- The stop time can be set within 24 hours from the start time. The day indication will not change even if the stop time runs into the following day.
- The BACK/NEXT CURSOR buttons can be used to move the cursor. Use this function to reach positions which require correction. Press NEXT to move the cursor forward; press BACK to move the cursor back.
- If an invalid number is entered in time setting, the entered data is cleared and the display returns to a blinking "----" when the ENTER button is pressed. In case of correct entry, the blinking position advances to the next.

Last-channel memory

- The currently tuned channel locks in the Timer Set mode and, when the display returns to the Clock mode, the locked channel is displayed.

Cancelling the preset data

- The preset programs can be cancelled by pressing the CANCEL button. For this purpose, first engage the Timer Set mode for the number you wish to cancel and then press the CANCEL button. With the remote control, to cancel the LCD memory, press the MEMORY CANCEL button; to cancel the VCR's memory, press the VCR CANCEL button.

Checking the programmed data

- Checking and re-programming can be performed anytime, even when the TIMER button has already been engaged in the ON position.
- To check the programmed data, press the PROGRAM button. To return to the Clock mode, press the DISPLAY button. The Clock mode will also be restored by pressing the PROGRAM button once after program number 8 is displayed.
- While recording is actually taking place, the stop time can be changed. Engage the Timer Set mode; only the stop time will flash. Re-program it.
- While recording is actually taking place according to one preset program, all other preset programs can be checked or re-programmed.

TIMER indicator (Error indication)

- When the TIMER button is pressed to ON with a cassette loaded and the timer correctly programmed, the TIMER indicator on the display will light with the corresponding preset program number(s) also lighting and the power is turned off.
- If two or more programs have overlapping times, the numbers of those programs will blink rapidly for 10 seconds after the TIMER button has been pressed. If no change is made in the programming, later programs will begin only after earlier programs are completed.
- When you have preset several programs at a time, confirm that all the preset program numbers light together with the TIMER indicator when the TIMER button is pressed. The program whose number does not light has not been correctly preset (for instance, the preset switch-on and switch-off times are the same). Recheck the programmed data.
- If all programs have been wrongly preset, the TIMER indicator will blink for about 10 seconds when the TIMER button is pressed, and then remains lit with no program number lighting.
- If the TIMER button is pressed when a cassette is not loaded, the TIMER indicator will continue blinking.
- If a cassette with its safety tab removed has been loaded, it will be ejected automatically when the TIMER button is pressed. The TIMER indicator will continue blinking.

Timer operation

- Tape loading starts 20 seconds before the preset switch-on time and the recording start signal is triggered 2 seconds before the preset time so that recording starts exactly at the preset time.
- During timer recording, the number of the program that is presently operating will be flashing.
- After timer recording, the power is switched off and the auto-rewind mechanism does not function. If the end of the tape is reached during timer recording, the cassette is automatically ejected and then the power is switched off with the TIMER indicator blinking.
- If a power failure should occur (and last longer than about 60 minutes), not only time-keeping stops (see page 21), but also all the preset data will be cancelled. A flashing SUN AM 12:00 indicates this after power has been reapplied. In such cases, first correct the time indication and then re-enter the programming data.

ADVANCED USAGE

RECORDING FM SIMULCAST TV PROGRAMS

FM simulcast TV programs can be recorded using an FM stereo tuner. Connect necessary components. (Connect the FM tuner to the AUDIO IN connectors.) Select the TV channel broadcasting the simulcast program with the recorder's channel select buttons and tune the FM stereo tuner to the station broadcasting the soundtrack for this TV program.

The only difference from the basic recording procedure (described on page 25) is the setting of the SOURCE SELECT switch.

- Set the SOURCE SELECT switch to SIMUL. Then the SIMUL indicator will light. With this setting, the audio signals from the built-in tuner will be recorded on the normal audio track and the audio signal from the FM stereo tuner will be recorded on the hi-fi audio track.

Notes:

- After finishing recording, be sure to set the SOURCE SELECT switch to TUNER.
- While recording simulcast programs, the hi-fi sound might be distorted momentarily at switching points between different programs (at the insertion of commercials, for example). This is not due to any defect of the unit.

RECORDING A TV PROGRAM WHILE RECORDING AN INDEPENDENT AUDIO SOURCE

Using the "simulcast" recording function, you can record independent audio and video programs, because the TV soundtrack is not lost, but recorded on the normal audio track. While recording a TV program, record any audio source independently.

- Connect an audio component (such as an FM tuner) to the AUDIO IN connectors.
- Set the SOURCE SELECT switch to SIMUL.

Notes:

- If you stop recording to avoid unwanted material of the TV program using the PAUSE/STILL button, the audio program from the external source is also cut.
- If television broadcasting comes to an end during recording, the hi-fi sound being recorded from the external source may be distorted. It is recommended that you check the timetable of TV broadcasts in advance.
- After finishing recording, be sure to set the SOURCE SELECT switch to TUNER; otherwise recording on the hi-fi audio track from the built-in tuner will not be possible.

USING THE HR-S8000U AS AN AUDIO DECK

Audio-only recording

You can record audio only (without recording any video signal) on the normal and hi-fi audio tracks. This means you can record a continuous 8-hour FM program onto a single cassette (T-160).

- Connect an audio source (such as an FM tuner) to the AUDIO IN connectors.
- DO NOT connect any equipment to the VIDEO IN connector.
- Set the SOURCE SELECT switch to AUX.

AUDIO DUBBING

Audio dubbing means recording a new soundtrack on a pre-recorded tape. In other words, the previously recorded sound is erased and replaced with a new soundtrack. Audio dubbing is applicable only to the longitudinal audio track (normal audio). Therefore, a dubbed narration can be heard together with the original hi-fi sound.

Procedure

- Switch on the TV receiver.
 - Adjust the TV receiver's channel to your video channel (3 or 4).
- Load a pre-recorded cassette. Power will be switched on automatically.
- Connect a microphone or an audio source to the MIC jack or the AUDIO IN connectors respectively.
 - With both microphone and audio source connected, mixed sound is recorded.
- Set the SOURCE SELECT switch to AUX.
 - If you record sound only from the microphone, the source equipment connected to the AUDIO IN connectors should be off.
- Press the PLAY/X2 button to start playback and then press the REW or FF button to search for the point from which you wish to start audio dubbing.
- Press the PAUSE/STILL button at the start point of audio dubbing.
- Press the AUDIO DUB button.
 - Press the PLAY/X2 button.
 - Audio dubbing will start.

Notes:

- It is recommended that you use a lower-impedance microphone.
- If a stereo source is connected to the AUDIO IN connectors, the mixed L and R sound is recorded.
- If whistling or howling is heard during audio dubbing, reduce the TV volume or move the microphone farther away from the TV. Recording is being performed even if sound is not heard from the TV receiver. If you want to monitor the sound being recorded, connect headphones to the PHONES jack.

INSERT EDITING

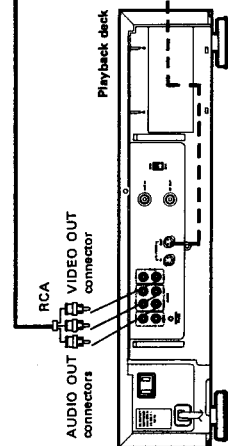
Insert editing means recording a new scene into a section of prerecorded tape so that a part of the original recording can be replaced with a new sequence without excessive picture distortion at edit-in and edit-out points. Thanks to the flying erase head, clean edits can be obtained. New video and audio signals to be inserted can come either from another video cassette recorder or the built-in tuner.

CAUTION

Since video and audio signals are recorded simultaneously, both are replaced with new recordings simultaneously. However, the normal audio soundtrack remains unchanged.

Connection

For inserting video and audio signals from another video cassette recorder.

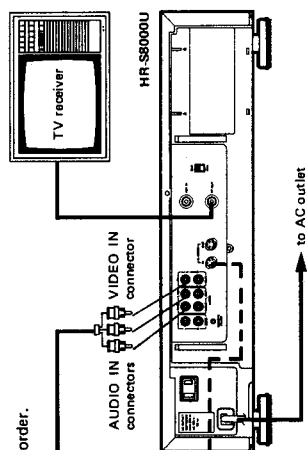


Procedure

- Switch on the TV receiver.
- Adjust the TV receiver's channel to your video channel (3 or 4).
- Load a prerecorded cassette.
- Press TV/VIDEO to engage the VIDEO mode (the indicator lights).
- Set the SOURCE SELECT and VIDEO IN SELECT switches as required. (See chart above.)
- Set the Hi-Fi audio recording level. (See page 19.)
- Play back the tape to determine the edit-out point (the end of the tape section to be replaced).
- Press the PAUSE/STILL button at the edit-out point.
- Press the COUNTER RESET button.
- The tape counter will be reset to "0000".
- Press the REW button to determine the edit-in point (the beginning of the tape section to be replaced).
- Press the PAUSE/STILL button at the edit-in point.
- Press the INSERT button.
- This engages the Insert Standby mode in which the input signal can be monitored on the TV screen; the still picture changes into the input signal that you are going to record.
- The input sound signal can also be monitored.
- Operate the source equipment properly.
- Play back on another recorder the tape program to be inserted.
- Select the channel to be recorded.
- Select the channel and set the FM tuner.

Setting options of the relevant switches

Source	Switch	SOURCE SELECT switch
To insert programs from a different tape	AUX (with VIDEO IN SELECT set as required - see page 9)	
To insert TV programs from the built-in tuner	TUNER	
To insert FM simulcast programs	SIMUL	



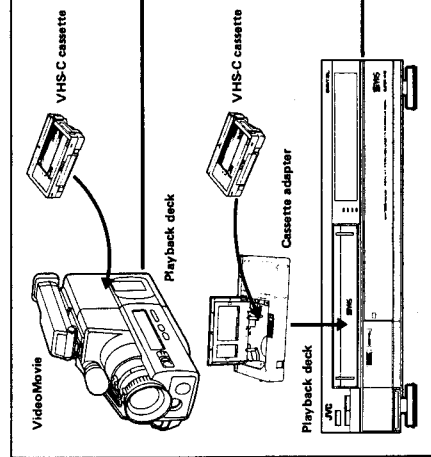
- Press the PLAY/X2 button to start insert editing.
- Now video and audio signals will be recorded simultaneously.
- At the counter reading of "0000", recording will stop automatically.
- The tape will continue running in the Play mode.

Notes

- Do not use the STOP button to stop insert editing. If you press the STOP button, the tape stops and the Insert Edit mode is cancelled.
- If you wish to stop insert editing before the specified edit-out point is reached, press the COUNTER RESET button. Then the Play mode will be entered.
- The recording mode (SP or EP) is automatically determined by the previous recording on which the new segment is inserted regardless of the setting of the SP/EP switch.
- If the edit start point of the new scene lies in the SP mode and the edit end point of the same scene lies in the EP mode or vice versa, the inserted picture will distort at the switching point in the recording mode.
- If there is a non-recorded section on the tape, the Insert mode will be cancelled automatically and the Play mode will be engaged.
- Edit mode will be cancelled automatically and the Play mode will be engaged.
- Insert editing is not possible with non-recorded cassettes or cassettes whose safety tab has been removed.

TAPE-TO-TAPE EDITING

VideoMovie recordings can be edited by using a VideoMovie camcorder (with playback facility) or a 2nd video deck.



- Connect the playback deck's VIDEO OUT and AUDIO OUT connectors (for the VideoMovie's AV OUT) to the recording deck's VIDEO IN and AUDIO IN connectors.
- Set the recording deck's SOURCE SELECT switch to AUX.
- Set the recording deck's S-VHS button as required.
- Put the playback deck in the Play mode.
- Put the recording deck in the Record mode.

Notes

- For S-VHS editing, also refer to page 12.
- For monaural audio connection, use the AUDIO IN L connector.

RECORDING WITH A VIDEO CAMERA

Connection

- To connect a video camera, an appropriate camera adapter is necessary.
 - Connect the video camera to the camera adapter.
 - Connect the camera adapter to the HR-S8000U; adapter's VIDEO OUT to recorder's VIDEO IN, and adapter's AUDIO OUT to recorder's AUDIO IN, and adapter's PAUSE to recorder's REMOTE PAUSE.
- For proper connection of a camera to the HR-S8000U, consult a JVC dealer.

Notes

- If feedback noise (whistling or howling) is heard from the TV receiver, reduce the volume or move the camera's microphone farther away from the TV receiver.

Tips for obtaining better results

The quality of the edited tape may vary depending on the position of the EDIT switch. It is recommended that you first make some trial recordings.

- With the EDIT switch of the playback deck set to ON and recording deck to OFF.
- With the EDIT switch of both playback and recording decks set to ON, and
- With the EDIT switch of both decks set to OFF.

Choose the setting combination that best suits your preference.

Note: Also refer to the instruction manual of the 2nd video recorder you are using.

Operation

- Turn the power on for all connected equipment.
- Adjust the TV receiver to your video channel.
- Load a cassette.
- Set the SOURCE SELECT switch to AUX and the S-VHS button as required.
- Press the TV/VIDEO button to obtain the VIDEO indication on the FDP.
- Set the SP/EP button as required.
- Press the REC/TR and then the PAUSE/STILL button.
- The recorder enters the Recording Standby mode.
- Operate the camera's start/stop switch.
- Recording starts and stops with this switch.
- To end the recording, press the STOP button.

- For camera operation refer to the instruction manual for the relevant camera.

IN CASE OF DIFFICULTY

What may initially appear to be trouble is not always a real problem. Make sure first . . .

POWER AND TAPE TRANSPORT PROBLEMS

Symptoms	Check points
No power is applied to the recorder.	- Is the power cord disconnected? - Connect it.
Clock is functioning properly, but the recorder cannot be powered.	- Is the TIMER indicator lit on the FDP? - Press the TIMER button to turn off the indicator.
Tape does not run during recording.	- Is the PAUSE/STILL button pressed to ON? - Press the PLAY/X2 button.
Tape stops in the Rewind or Fast Forward mode.	- Is the COUNTER MEMORY function engaged? - Set it to OFF.
Tape will not rewind or fast forward.	- Is the tape already fully rewound or fast forwarded? - Check the cassette.

RECORDING PROBLEMS

Symptoms	Check points
Recording cannot be started.	- Is a cassette loaded? - Is the safety tab on the cassette removed? - Reset the slot with cellophane tape.
TV broadcasts cannot be recorded.	- Is the SOURCE SELECT switch set to AUX or SIMUL? - Set it to TUNER.
Camera recording is not possible.	- Are the camera and the camera adapter correctly connected? - Is the power switch of the camera adapter set to ON? - Is the SOURCE SELECT switch set to a position other than AUX? - Set it to AUX.
Simulcast recording is not possible.	- Is the SOURCE SELECT switch set to a position other than SIMUL? - Set it to SIMUL. - Is an audio source correctly connected to the AUDIO IN connectors? - Check connections.
Timer recording is not possible.	- Have you set the clock correctly and programmed the timer correctly? - Check once again. - Is the TIMER indicator lit on the FDP? - If not, press the TIMER button to light the indicator.

HI-FI AUDIO PROBLEMS

Symptoms	Check points
TV sound cannot be recorded on hi-fi audio tracks.	- Is the SOURCE SELECT switch set to SIMUL? - Set it to TUNER.
Breaks are noticeable in hi-fi audio reproduction.	Adjust with the TRACKING control buttons. (See page 20.)
Soundtrack on the hi-fi audio track cannot be reproduced.	- Is the AUDIO MONITOR select button set to NORMAL? - Set it to HI-FI.
Audio level indicators do not function.	- Is the LEVEL INDICATOR switch set to OFF? - Set it to ON.

PLAYBACK PROBLEMS

Symptoms	Check points
Playback picture does not appear while the tape is running.	- Is the TV receiver's channel selector set to the correct video channel? - Set it to the RF converter channel (3 or 4). (See page 14.)
Noise appears on the search and still pictures.	This is normal.
Noise appears during normal playback.	Adjust the TRACKING control buttons.
Playback picture is blurred or interrupted while TV broadcasts are clear.	- Video heads may be dirty. - Head cleaning is necessary. Consult your nearest JVC dealer.

OTHERS

Symptoms	Check points
Whistling or howling is heard from TV during camera recording.	Move camera's microphone away from TV or reduce TV sound volume.
Clock setting is not possible.	- Is the TIMER indicator lit on the FDP? - Press the TIMER button to turn off the indicator.
Some channels are skipped over when scanning channels.	Those channels are preset to be skipped over. If you need them, restore them. (See page 16.)
Channel cannot be switched.	- Is recording in progress? - Press the PAUSE/STILL button, select a desired channel and press the PLAY/X2 button.
Snowy picture on screen when viewing TV programs while recording another program.	- Is the VIDEO indicator lit? - Press the TV/VIDEO button so that the indicator extinguishes.

This recorder contains microcomputers. External electronic noise or interference could cause malfunctioning. In such cases, switch the power off and unplug the power cord. After a few minutes, plug it in again and switch on. Take out the cassette. After checking the cassette, operate the unit as usual.

HEAD CLEANING

- Picture playback may become blurred or interrupted while the TV program received is clear. This does not mean that the recorded program has been erased.

- Dirt accumulated on the video heads after long periods of use causes such troubles. In this case, head cleaning requiring highly technical care is necessary.
- For head cleaning, consult the nearest JVC dealer.

SPECIFICATIONS

Format	: S-VHS/VHS NTSC standard with Hi-Fi audio	Signal-to-noise ratio	: 45 dB (Rohde & Schwarz noise meter) with PICTURE SHARPNESS control at center position
Video recording system	: Rotary, two-head helical scan system with slant double-azimuth combination video heads	Horizontal resolution	: More than 400 lines (S-VHS)/240 lines (VHS) with PICTURE SHARPNESS control at center position
Hi-Fi audio recording system	: Deep-layer recording system conforming to stereo Hi-Fi VHS standard	Audio	
No. of audio channels	: 2 Hi-Fi audio channels	Input	: -8 dBs, more than 50 k-ohms, unbalanced
Video signal system	: 1 normal audio channel	Output level	: -6 dBs, high impedance load
Tape width	: NTSC-type color signal and separated Y/C signals conforming to NTSC.	Output impedance	: Less than 1 k-ohm, unbalanced
Tape speed	: 12.65 mm (1/2 inch)	Signal-to-noise ratio	: More than 40 dB (Normal audio)
(SP)	: 33.35 mm/s (1.5/16 ips)	Frequency range	: 70 Hz to 10,000 Hz (Normal audio)
(EP)	: 11.12 mm/s (7/16 ips)	Hi-Fi audio	
Maximum recording time		Frequency response	: 20 Hz to 20,000 Hz
(SP)	: 160 min. with T-160 video cassette	Dynamic range	: More than 90 dB
(EP)	: 480 min. with T-160 video cassette	Wow and flutter	: Less than 0.005 % WRMS
Temperature		Timer	: 14-day programmable timer
Operating	: 5°C to 40°C (41°F to 104°F)	Dimensions	: 467 mm(W) x 107 mm(H) x 373 mm(D)
Storage	: -20°C to 60°C (-4°F to 140°F)	Weight	: 18-7/16" x 4-1/4" x 14-11/16"
Antenna	: 75 ohms, unbalanced	Provided accessories	: "AA"-size battery x 2
Channel coverage			: Infrared remote control unit
(VHF)	: Channels 2 - 13		: S-VIDEO cable (4-pin)
(UHF)	: Channels 14 - 69		: Matching transformer
(CATV)	: 113 channels		: Antenna extension cable
RF output signal	: Channel 3 or 4 (switchable; preset to channel 3 when shipped)		: Antenna splitter
	: 75 ohms, unbalanced		: Antenna cable (F-type)
Power requirement	: AC 120 V~, 60 Hz		: Audio cable
Power consumption	: 48 W		: S-VHS cassette tape
Video			
Input	: 0.5 to 2.0 Vp-p, 75 ohms, unbalanced		
Output	: 1.0 Vp-p, 75 ohms, unbalanced		

Specifications shown are for SP mode unless otherwise specified. Design and specifications subject to change without notice.

SECTION 1

MECHANISM ADJUSTMENT

1.1 GENERAL

1.1.1 Precautions

IMPORTANT:

1. Disconnect unit from power before removing or soldering components.
2. When removing a fastener (screw, washer, etc.), be careful not to drop it into the mechanism. If a fastener should be dropped, be sure to retrieve it.
3. The tape transport mechanism has been precisely adjusted at the factory and ordinarily does not require readjustment.
4. When removing a part, be very careful not to damage or displace other parts. (Be especially careful with the tape guides and rotary video head drum.)
5. For service procedures that call for operation of the set when the cassette housing is separated from the main-deck, perform as below.
 - 1) Set a sheet of insulated material on the right of the chassis.
 - 2) Remove the cassette housing from the main-deck and place it on the insulated sheet, but do not disconnect the connector from the MECHACON board.
 - 3) Insert a cassette into the cassette housing. The housing mechanism functions to retract the cassette.
 - 4) Disable the photo transistor sensor (END SENSOR) on the main-deck by applying an opaque cover.
 - 5) The desired modes can be obtained by using the operation switches.

1.1.2 Required test equipment, fixtures and tools

For proper mechanical adjustment, the following test equipment, fixtures and tools are strongly recommended. Without them, a long trial-and-error period would be necessary, resulting in possible damage. In addition, general-purpose tools are required.

1. Test equipment required:

Color television or monitor

Oscilloscope: Wide-band, dual trace, triggered, delayed sweep

Recording tape

Alignment tapes

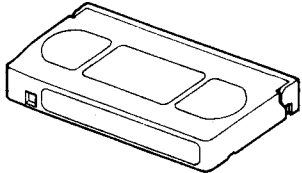
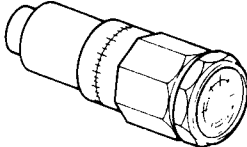
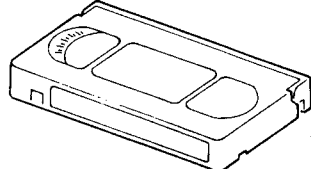
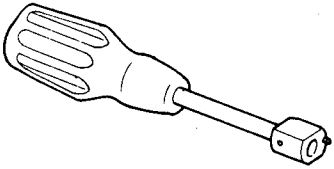
Alignment tape MH-1, MH-1L, MH-F1 	Torque gauge assembly PUJ48075-2 	Back tension cassette gauge PUJ48076-2 
A/CTL head position tool PUJ47351-2 		

Table 1-1-1 Fixtures and tools

1.1.3 Disassembly

1. Top cover

- 1) Take out four screws from the right and left sides of the side panel assembly (L) and (R).
- 2) Take out one screw from the rear side of the set.
- 3) Tilt up the rear end of the top cover, then remove it.

2. Front panel

- 1) Remove the top cover.
- 2) Bend three upper hooks of the front panel assembly upward to disengage them from their chassis retainers.
- 3) Disengage three lower hooks of the front panel assembly from their chassis retainers in order to remove the front panel assembly.

3. Bottom cover

- 1) Take out four screws and four feet from the bottom side of the set.
- 2) Take out three screws from the bottom side of the set.
- 3) Set free the bottom cover from its six retainers of the chassis in order to remove the bottom cover.

4. Cassette housing door

- 1) Remove the front panel assembly.
- 2) Bend center of the cassette housing door toward you, then pull out the right end from the cassette housing.
- 3) Use care regarding the torsion spring, then pull out the left end of the cassette housing door to remove it.

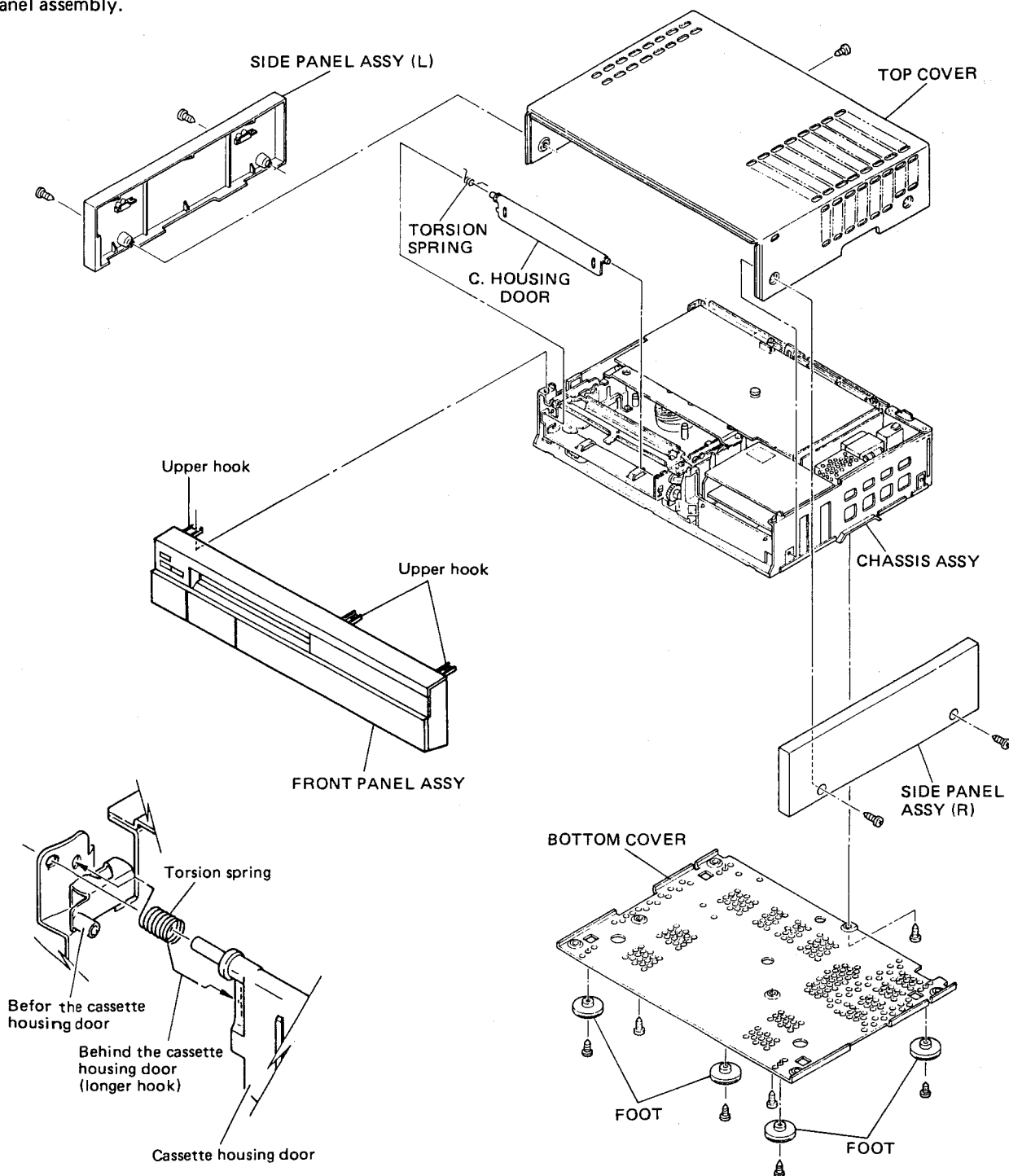


Fig. 1-1-1 Removal of external covers

1.1.4 Layout of main parts

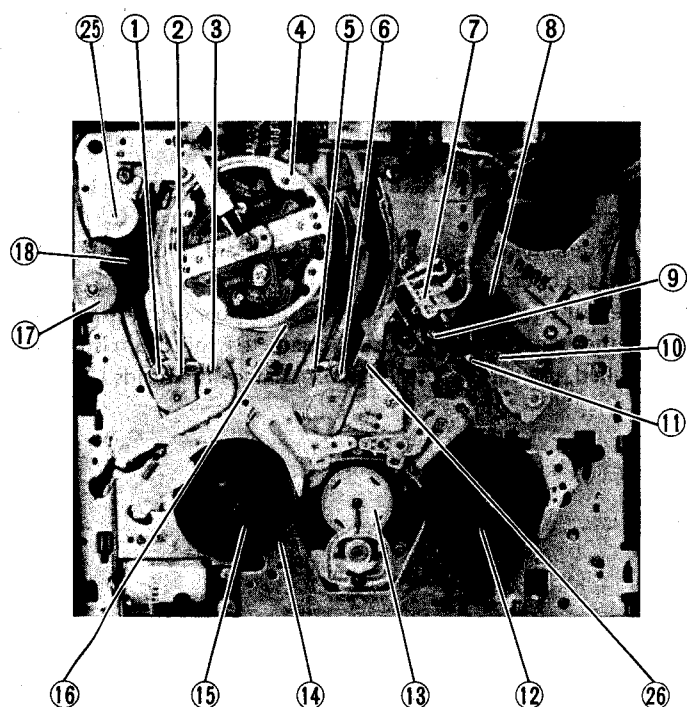


Fig. 1-1-2 Top view of main-deck

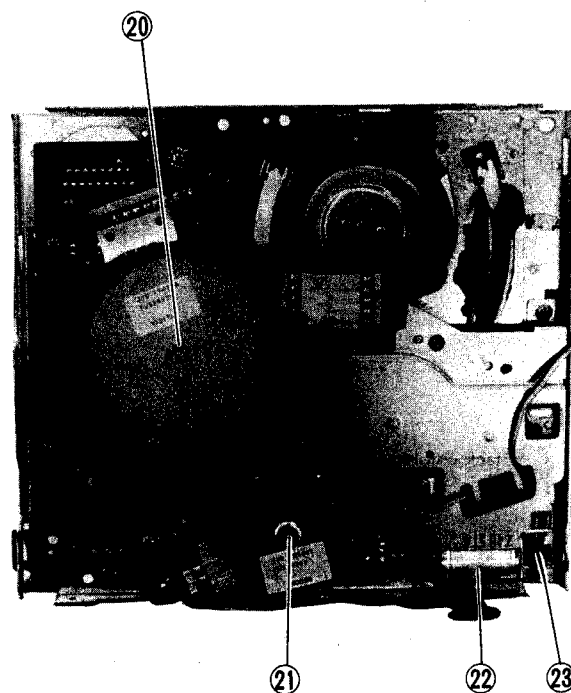


Fig. 1-1-3 Bottom view of main-deck

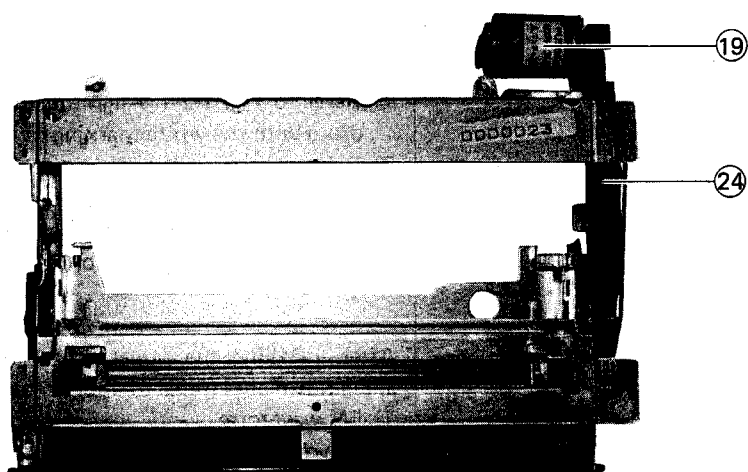


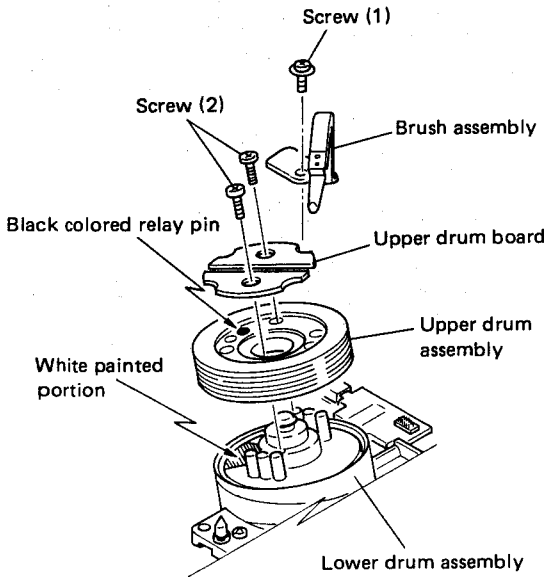
Fig. 1-1-4 Cassette housing

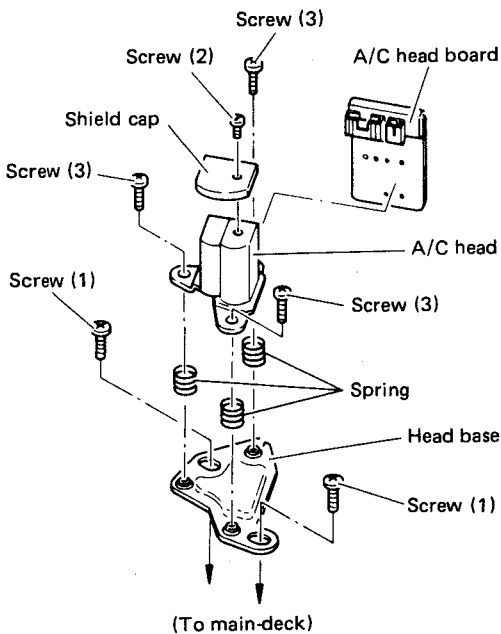
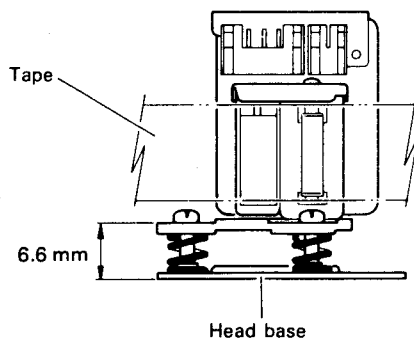
1. Supply guide roller
2. Supply slant pole
3. Tension pole
4. Upper drum
5. Take-up slant pole
6. Take-up guide roller
7. A/C head
8. Pinch roller

9. Take-up guide pole
10. Guide arm
11. Capstan
12. Take-up reel disk
13. Reel idler
14. Tension band
15. Supply reel disk
16. Lower drum

17. Impedance roller
18. Full erase head
19. Cassette motor
20. Capstan motor
21. Reel motor
22. Mode motor
23. Mode belt
24. Cassette belt
25. Roller
26. Half loading arm

1.2 MAIN ASSEMBLY REPLACEMENT

No.	Item	Adjustment parts	Operating mode	Description
1	Upper drum assembly			Note: When installing the new upper drum, use care not to touch the video heads. If heads are soiled, clean with a soft, finely woven cotton cloth or chamois that has been moistened in alcohol. Hold lightly against the heads and turn the drum clockwise. By no means clean with a vertical stroke. 1) Refer to Fig. 1-2-1. Take out screw (1) and remove the brush assembly. 2) Use a desoldering tool or desoldering braid to unsolder the upper drum boards. 3) Take out two screws (2) and raise the upper drum to remove it together with the upper drum board. (If this drum is to be re-installed, use care not to touch or damage the heads.)
	— Removal —			
	 Fig. 1-2-1 Upper drum assembly			
	— Installation —			1) Refer to Fig. 1-2-1. Align the black relay pin of the new upper drum with the white marking of the lower drum. 2) Reinsert screws (2) and tighten them in a balanced manner. 3) Reinstall and solder the upper drum boards. 4) Clean the drum assemblies (see above note). 5) Reinstall the brush assembly and secure with screw (1).
	— Checks and adjustments —			After installing the upper drum, perform the following checks and adjustments (refer to appropriate Sections of this Manual). 1) FM waveform 2) Servo circuit 3) Video circuit 4) FM audio circuit

No.	Item	Adjustment parts	Operating mode	Description
2	A/C head (Audio/Control head) — Removal —  (To main-deck) Fig. 1-2-2 A/C head			1) Disengage connectors attached to the A/C head board. 2) Take out two screws (1) and remove the A/C head together with the head base. 3) Unsolder and remove the A/C head board from the A/C head. 4) Take out screw (2) and remove the shield cap from the A/C head. 5) Take out three screws (3) and remove the A/C head from the head base. Use care regarding the three springs.
	— Installation —  6.6 mm Fig. 1-2-3 A/C head height			1) Install the A/C head by reversing the removal steps of above. 2) Temporarily set the A/C head height above the head base for 6.6 mm (see Fig. 1-2-3).
	— Checks and adjustments —			1) Use a spare tape (not Alignment tape) and confirm proper operation of the tape transport (see Section 1.5). 2) Perform interchangeability adjustment (see Section 1.6).

No.	Item	Adjustment parts	Operating mode	Description
3	Tension band assembly			1) Take out screw (1) and disengage the tension band assembly from the tension arm assembly (see Fig. 1-2-4). 2) Remove and replace the tension band assembly. 3) Perform tension pole position adjustment (see Section 1.4).

The diagram shows a mechanical assembly. A 'Tension arm assembly' is shown with a 'Tension band assembly' attached to it. A 'Screw (1)' is shown being removed from the tension band assembly. The tension band assembly is a curved metal piece with a small hook at one end. The tension arm assembly is a larger metal piece with a central pivot point and a smaller arm extending from it.

Fig. 1-2-4 Tension band assembly

1.3 ASSEMBLY PROCEDURE OF MECHANISM

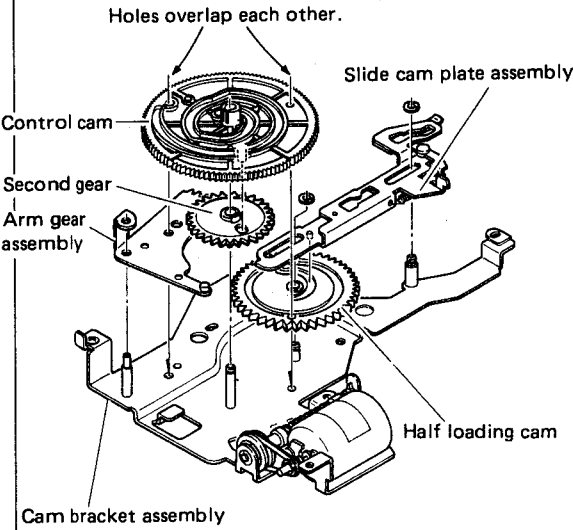
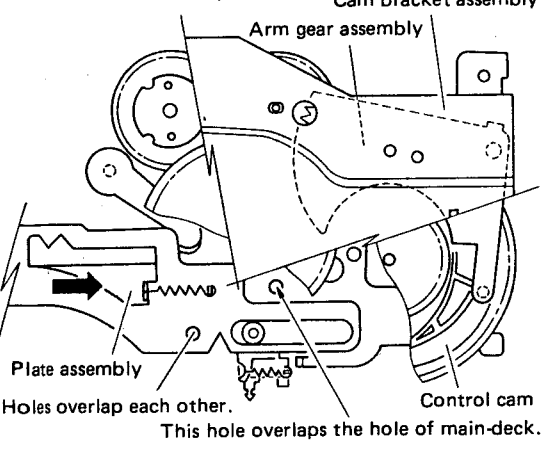
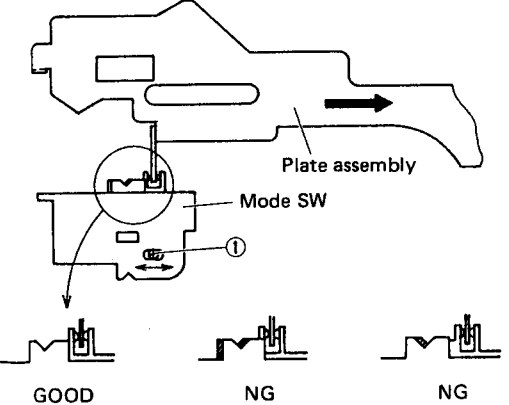
No.	Item	Adjustment parts	Operating mode	Description
	A close relationship exists between the mode select switch and the mechacon circuit. Therefore, the mode select switch and control arm engagement determines the overall mechanical operations of the levers, gears, rollers, etc. If these parts are not properly positioned, the video deck becomes stalled in the unloading or Stop mode.			
1	Loading arm assemblies			These assemblies are comprised of loading gears, torsion springs and loading arms. 1) Refer to Fig. 1-3-1 and install the loading arm assemblies correctly. 2) The take-up and supply loading arm positions with respect to the loading gear holes are indicated in Fig. 1-3-2. This configuration is important to allow shifting to the next operation.

The diagram shows two loading arm assemblies. The 'Take-up loading arm assembly' is on the left and the 'Supply loading arm assembly' is on the right. Both assemblies consist of a circular base with a central gear and a lever arm extending from it. Arrows indicate the direction of movement for each assembly.

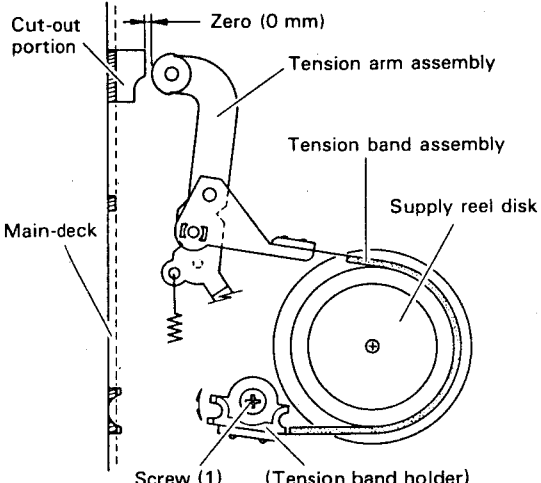
Fig. 1-3-1 Loading arm assembly (1)

The diagram shows the two loading arm assemblies from a different perspective. The 'Take-up loading arm assembly' is on the left and the 'Supply loading arm assembly' is on the right. The take-up assembly is labeled '(Black)' and the supply assembly is labeled '(White)'. Arrows indicate the direction of movement for each assembly. The text 'Holes confront each other.' is written above the assemblies. The text '(To take-up pole base)' is written below the take-up assembly and '(To supply pole base)' is written below the supply assembly.

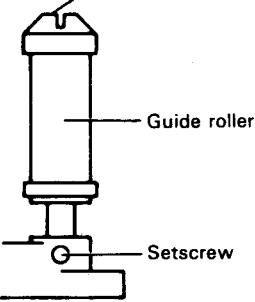
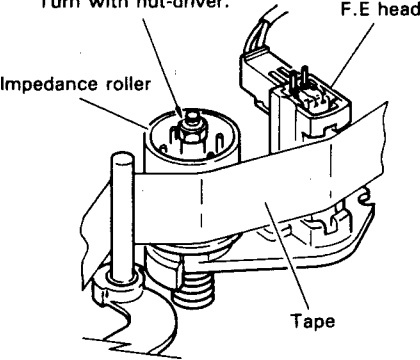
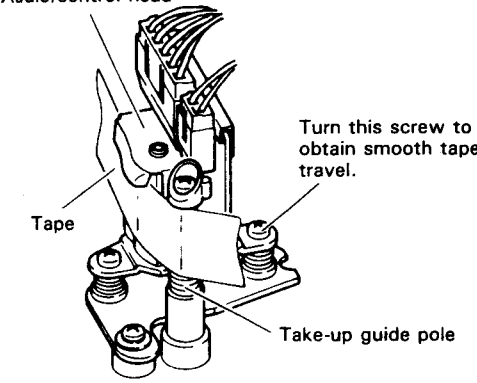
Fig. 1-3-2 Loading arm assembly (2)

No.	Item	Adjustment parts	Operating mode	Description
2	Control cam			1) Install the half loading cam on the cam bracket assembly, then mount the slide cam plate assembly so that its stud sets into the groove on the half loading cam. 2) Install the arm gear assembly on the cam bracket assembly. 3) Assemble the second gear and the control cam so that the stud of the control cam sets into the hole of the second gear. 4) Mount the above assembly (control cam and second gear) on the cam bracket assembly to satisfy the relation indicated in figure. 5) Do not turn the control cam from this position for the next step.
	 Fig. 1-3-3 Control cam			
3	Cam bracket assembly			1) Refer to Fig. 1-3-4 and press the plate assembly toward the right to overlap the indicated hole with that of the main deck. 2) Then install the cam bracket assembly. Note: If the arm and loading gears do not mesh properly, use a jeweler's screwdriver or similar tool to engage the gear teeth while installing the cam bracket assembly.
	 Fig. 1-3-4 Cam bracket assembly			
4	Mode switch position			1) Engage the plate assembly and mode switch as shown in Fig. 1-3-5. Partially tighten screw (1) to where the switch can still be shifted for adjusting the position. 2) Press the plate assembly toward the right to where the holes are overlapped as in Fig. 1-3-4. Insert a jeweler's screwdriver into the holes to keep them aligned. 3) Shift the mode switch to align the V-notch as indicated in Fig. 1-3-5. Then tighten screw (1) to secure. 4) Remove the jeweler's screwdriver, then reinstall and solder the circuit board.
	 Fig. 1-3-5 Mode switch			

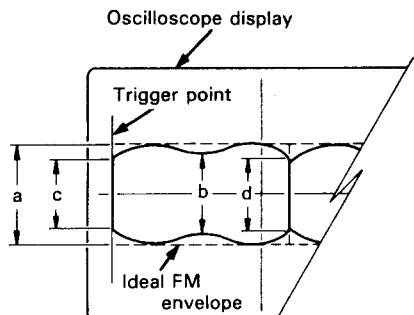
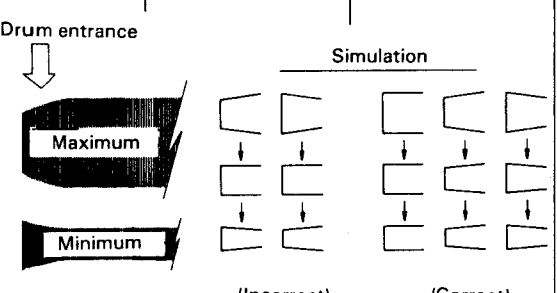
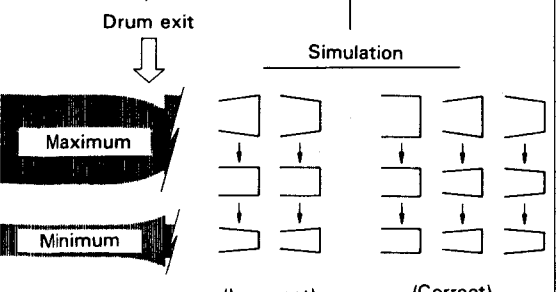
1.4 CONFIRMATION AND ADJUSTMENT

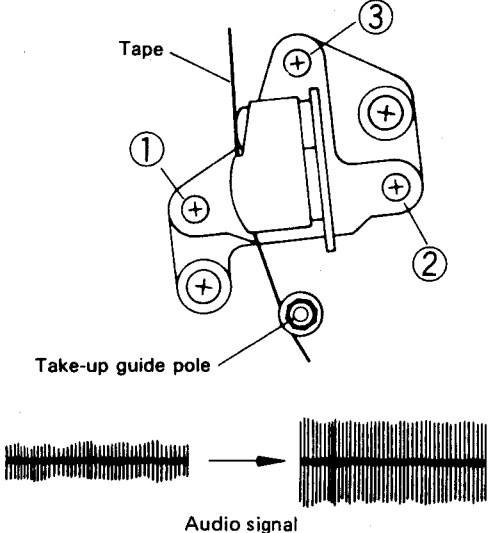
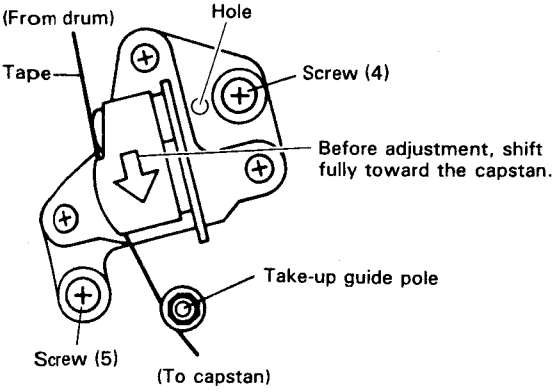
No.	Item	Adjustment parts	Operating mode	Description
1	Tension pole position  Fig. 1-4-1 Tension pole position			1) Without a cassette tape, set for the Play mode (see Section 1.1). 2) Refer to Fig. 1-4-1. Slightly loosen screw (1). Adjust the tension band holder position for 0 mm separation between the tension arm and cutout position. 3) Tighten screw (1) to secure the tension band holder. 4) Use the back tension cassette gauge and set for the Play mode. 5) Check for a scale reading between 25 and 75. 6) If outside this range, clean the tension band contacting portions of the supply reel disk with alcohol, or check the condition of the tension arm spring. If necessary, replace the tension band assembly.
2	Take-up torque			1) Without a cassette tape, set for the Play mode (see Section 1.1). 2) Set the torque gauge on the take-up reel disk. 3) Grasp the torque gauge lightly so that it rotates and read the value when the scale matches the indicator needle. Confirm a value between 45 and 155. 4) If outside this range, clean the rubber portion of the idler arm with alcohol, or if necessary, check the reel motor drive circuit.

1.5 TAPE TRANSPORT CHECKS AND ADJUSTMENT PREPARATIONS

No.	Item	Adjustment parts	Operating mode	Description
	The tape transport system has been precision-adjusted at the factory and ordinarily does not require readjustment. However, adjustment may become necessary after long term usage or after replacing parts that affect the tape transport. The following steps mainly cover preparations for the interchangeability adjustments of Section 1.6.			
1	Guide roller	Turn with screw-driver.  Fig. 1-5-1 Guide roller		1) During interchangeability adjustments, the guide roller is turned with a flat-blade screwdriver to adjust its height and correct FM waveform linearity. Use a metric hex key (1.25 mm) to slightly loosen the setscrew at the base of the guide roller (see Fig. 1-5-1). Loosen the setscrew just sufficiently to allow the guide roller to be turned. If too loose, tape transport will be too unstable to permit correct adjustment.
2	Impedance roller	Turn with nut-driver.  Fig. 1-5-2 Impedance roller		1) This compensates for tape running stability between the cassette and head drum. After adjusting the supply guide roller, the impedance roller height is adjusted for smooth tape transport at the lower flange. 2) Use a metric nutdriver (5.5 mm) to adjust by turning the upper nut (see Fig. 1-5-2). However, note that excess turning can disturb the FM waveform stability.
3	A/C head (audio/control head)	 Fig. 1-5-3 A/C head		1) After adjusting the take-up guide roller, adjust the A/C head inclination for smooth tape travel at the lower flange of the take-up guide pole. Refer to Fig. 1-5-3.

1.6 INTERCHANGEABILITY CHECKS AND ADJUSTMENTS

No.	Item	Adjustment parts	Operating mode	Description
	Before using costly Alignment tape, use a spare tape and confirm correct operation of the tape transport.			
1	FM waveform $\frac{b}{a} \geq 0.7, \frac{c}{a} \geq 0.5 \text{ and } \frac{d}{a} \geq 0.5$  Fig. 1-6-1 FM envelope  Fig. 1-6-2 Drum entrance  Fig. 1-6-3 Drum exit			1) Connect oscilloscope to the FM OUT testpoint of the video playback circuit. Trigger the oscilloscope externally with the signal from the drum flipflop (D-FF or FF) testpoint. Set the trigger slope to minus (-). 2) Play the MH-1 Alignment tape and adjust the tracking for maximum FM waveform output. Refer to Fig. 1-6-1. Confirm the relationships indicated in the figure for maximum output (a), minimum center output (b), minimum output at the drum intake (c) and minimum output at the drum output (d). 3) Adjustment is required if the above specifications are not fulfilled. Even when these are fulfilled, check that the FM waveform varies linearly overall. If not, slight deviation in tracking will cause a large proportional level drop to result in noise appearing in the picture. Therefore, in this condition, proceed to the following checks and perform adjustments where necessary. 4) Operate the tracking adjustment between minimum and maximum outputs of the FM waveform. Observe the portion of the waveform corresponding to the drum intake (see Fig. 1-6-2). As the tracking is adjusted, although the gain may increase or decrease, the geometric shape of this part of the waveform should remain consistent. If the shape varies, as shown by the incorrect examples in the figure, carefully perform adjustment of the supply guide roller height. 5) Next observe the portion of the waveform corresponding to the drum output (see Fig. 1-6-3), while operating the tracking adjustment. This should also vary only in gain, but not in shape. If the shape varies, as shown by the incorrect examples in the figure, carefully perform adjustment of the take-up guide roller height. 6) Check the overall FM waveform. Fine-adjust both guide rollers so that variation is as minimum and linear as possible. 7) Observe the tape travel at the guide rollers and guide poles. Confirm absence of tape creasing or curling. Confirm that the tape properly rides at the lower flange of the supply guide pole. Carefully adjust the guide pole height if necessary. This adjustment is important and affects FM waveform response. If creasing or curling is observed at the take-up guide pole, carefully adjust the audio/control head inclination so that the tape rides properly at the lower flange of the guide pole. Finally, again check the FM waveform.

No.	Item	Adjustment parts	Operating mode	Description
2	A/C head adjustments	 Fig. 1-6-4 A/C head		Proper adjustment of the A/C head position is important for ensuring adequate audio output and S/N. Severe misalignment can prevent control signal pick-up and cause servo instability. Precise adjustment is particularly important for models that include tape indexing and addressing features, since these rely on control signal coding for operation. To observe the audio signal, connect an oscilloscope to the test point (AUDIO OUT) of the audio circuit, or directly to the audio output terminal. In some cases, monitoring the sound with headphones may be helpful. 1) Play the stairstep (audio 7 kHz) portion of the MH-1 Alignment tape. 2) Adjust screw (3) (Fig. 1-6-4), which is the azimuth adjustment, for maximum output. 3) Turn screws (1), (2) and (3) by small and equal increments (about 45° at a time) to adjust the A/C head height for maximum audio output. Slightly raise and lower the height to confirm the maximum output position. 4) Observe the FM waveform and tighten the guide roller set-screws. Use care not to disturb the height adjustments. Then again confirm the FM waveform.
				This determines the distance between the sound and picture information on the tape. Correct adjustment is important for providing synchronization of picture and sound in the program. Incorrect adjustment is particularly noticeable in the slow speed (EP) mode. Observe the FM waveform by connecting an oscilloscope to the video play-back circuit test point (FM OUT). Trigger the oscilloscope externally with the drum flipflop signal. Use plus (+) trigger to view the CH-2 waveform. Set the tracking adjustment to the neutral (AUTO) position. 1) Play the stairstep portion of the MH-1 Alignment tape. 2) See Fig. 1-6-5. Slightly loosen screws (4) and (5). Set the A/C head positioning tool over screw (4) with the pin of the tool inserted into the indicated hole. 3) Turn the tool counterclockwise to shift the A/C head fully toward the capstan direction. 4) While observing the CH-2 FM waveform, gradually turn the tool clockwise. Stop at the peak output position and tighten screw (5). Remove the tool and tighten screw (4). 5) Replace alignment tape MH-1L with MH-1, play back the stairstep segment of the alignment tape MH-1L. 6) Operate the tracking adjustment and confirm that the maximum FM waveform is obtained at the neutral setting. 7) If the FM output peak is not obtained at tracking neutral position, shift the A/C head at the FM output peak nearest to this position.
3	Control head phase (X value)	 Fig. 1-6-5 Control head phase		

No.	Item	Adjustment parts	Operating mode	Description
4	Final checks			1) Supply a video or TV signal (monochrome is preferable). Use a spare tape and record and play back. Confirm that the play-back FM signal conforms to the parameters indicated in Fig. 1-6-1. Check for both SP and EP modes. 2) Connect the oscilloscope to the test point (FM OUT) of the FM audio play-back circuit. Play the stairstep portion (which includes the FM audio carrier) of the MH-1L Alignment tape. Confirm absence of severe drop in FM waveform level. 3) Perform the checks and, if necessary adjustments, of the Electrical Adjustments Section for the servo, video and audio (and FM audio) circuits.

SECTION 2 ELECTRICAL ADJUSTMENTS

2.1 PREPARATION

Electrical adjustments are required after replacing circuit components and certain mechanical parts.

It is important to perform these adjustments only after all repairs and replacements have been completed. Also, do not attempt these adjustments unless the proper equipment is available.

2.1.1 Required test equipment

1. Color television or monitor
2. Oscilloscope: wide-band, dual-trace, triggered delayed sweep
3. Frequency counter
4. Audio generator
5. Audio voltmeter
6. Digital voltmeter
7. Signal generator: TV-channel
8. Signal generator: NTSC color bars, staircase, video sweeper or multi-burst
9. Recording tape
10. Alignment tapes: MH-1, MH-1L, MH-1H, MH-F1
11. Patch cord: PTU94001 (PRE/REC board to CONNECTOR board)

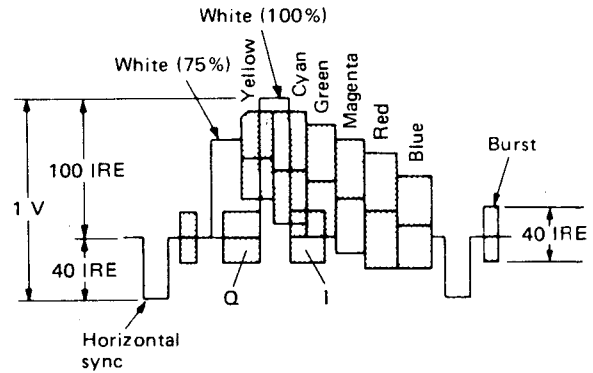


Fig. 2-1-1 Color bars signal waveform

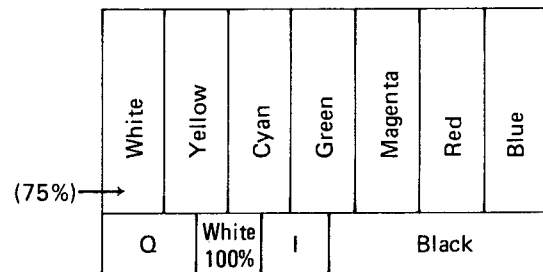


Fig. 2-1-2 Color bars pattern

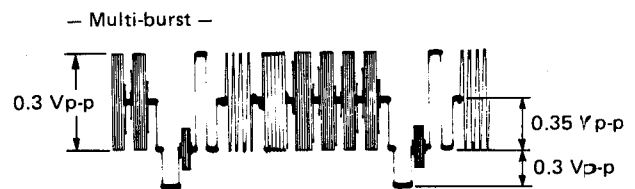


Fig. 2-1-3 Input signal level for multi-burst

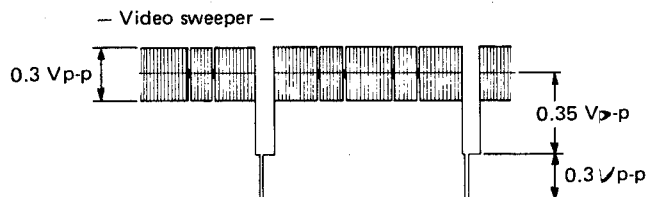


Fig. 2-1-4 Input signal level for video sweeper

2.1.2 Check and adjustment steps

The check and adjustment steps are provided in the following in the form of charts. For clarity, the nomenclature used in the charts is outlined below.

No.	Checks and adjustments are numbered in the recommended sequence in which they are to be performed.
Item	Name assigned to the particular check and adjustment step.
Check Point	Location to which measuring instrument (oscilloscope unless otherwise noted) is to be connected.
Adjustment Parts	Variable component (resistor, capacitor, etc.) to be adjusted in this step. Dash (—) indicates check only.
Signal & Mode	• Input signal required to perform adjustment. Dash (—) indicates that special signal is not required. • Equipment operating mode at time of check or adjustment.
Color bars	Color bars signal as video input.
Stairstep	Stairstep signal as video input.
1 kHz	1 kHz sinewave as audio input signal.
MH-1 color bars	Color bars segment of MH-1 alignment tape.
MH-1 stairstep	Stairstep segment of MH-1 alignment tape.
MH-1 1 kHz	1 kHz audio signal segment of MH-1 alignment tape.
MH-1 RF sweep	RF sweep segment of MH-1 alignment tape.
MH-1L color bars	Color bars segment of MH-1L alignment tape.
MH-1L stairstep	Stairstep segment of MH-1L alignment tape.
MH-1L RF sweep	RF sweep segment of MH-1L alignment tape.
MH-1M color bars	Color bars segment of MH-1M alignment tape.
MH-1M stairstep	Stairstep segment of MH-1M alignment tape.
MH-1H color bars	Color bars segment of MH-1H alignment tape.
MH-F1 stairstep	Stairstep segment of MH-F1 alignment tape.
MH-F1 1 kHz	1 kHz FM audio signal segment of MH-F1 alignment tape.

E-E	Power on and machine in Stop mode.
REC	Recording mode
PB	Playback mode
SEARCH	Search (FWDS and REVS) playback mode
SLOW	Slow motion playback mode
STILL	Pause during playback mode
A DUB	Audio dubbing mode
SP mode	SP recording speed
EP mode	EP recording speed
LP mode	LP recording speed
S-VHS mode (S mode)	Super-VHS recording mode

Description	This column provides an explanation of the step, notes and adjustment values.
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2.2 SWITCHING REGULATOR CIRCUIT

Note: Unless otherwise noted, all test points and adjustments are located on the SWITCHING REGULATOR board.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	5 V DC output voltage	CN6-1	R29	• REC • SOURCE SEL: TUNER	1. Connect a digital voltmeter between CN6-1 and TP-GND. 2. Record in the TUNER mode, adjust R29 for 5.34 ± 0.05 V.
2	SEMIREG 15 V output voltage	CN1-7	R100	• REC • SOURCE SEL: TUNER	1. Connect a digital voltmeter between CN1-7 and TP-GND. 2. Record in the TUNER mode, adjust R100 for 15.1 ± 0.1 V.

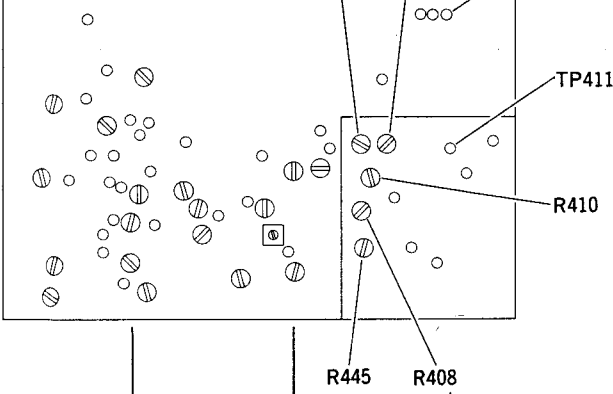
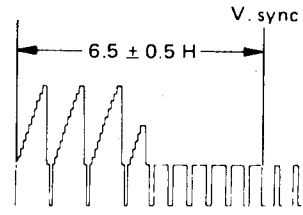
2.3 TIMER CIRCUIT

Note: Unless otherwise noted, all test points and adjustments are located on the TIMER board.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	Timer clock	TP2	C9	• E-E	1. Connect a frequency counter between TP2 and GND. 2. Short between GND and TP1 (TEST), then short the leads of electrolytic capacitor C5 once in order to reset IC1. 3. Adjust C9 for 2048.000 ± 0.002 Hz (488.2808 to 488.2818 μ s).

2.4 SERVO CIRCUIT

Note: Unless otherwise specified, all test points and adjustments are located on the MAIN board.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	PB Switching Point	VIDEO OUT or TP10	R445 (CH-1)	• PB • MH-1 Stairstep • Trigger slope (—) • SP mode	1. Connect an oscilloscope to VIDEO OUT or TP10 of the main board. 2. Play back the stairstep segment of MH-1 alignment tape. 3. Trigger the oscilloscope externally (— slope) with the signal from TP411 (DRUM FF). 4. Adjust R445 to position the trigger point $6.5 \pm 0.5H$ from V. sync.
					 Fig. 2-2-1
2	Slow Tracking	Monitor	R472	• Slow PB (1/6) • SP mode	Note: Slow motion will start automatically after pressing the search button. 1. Set the tracking control of the FRONT to the pre-set position by simultaneously pressing the + and — tracking buttons. 2. Record a color bar signal in the SP mode, then play back in the Slow mode. 3. Adjust R472 to minimize noise bars in the monitor-TV display.
3	2X normal Tracking	Monitor	R410	• 2X Play • SP mode	1. Set the tracking control of the FRONT panel to the pre-set position by simultaneously pressing the + and — tracking buttons. 2. Record a color bar signal in the SP mode, then playback in the 2X play mode. Adjust R410 to minimize noise bars in the monitor-TV display.
		Monitor	R408	• 2X Play • EP mode	3. In the same manner, adjust R408 for the EP mode.

2.5 VIDEO CIRCUIT

Note: Unless otherwise noted, all test points and adjustments are located on the MAIN board.

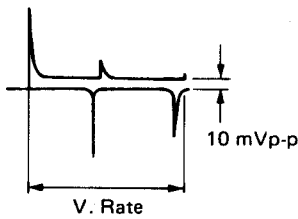
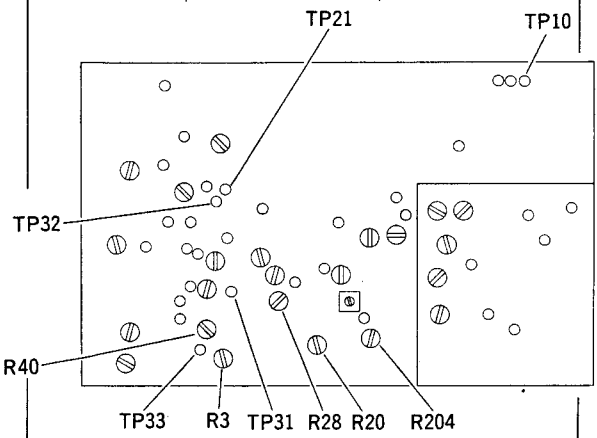
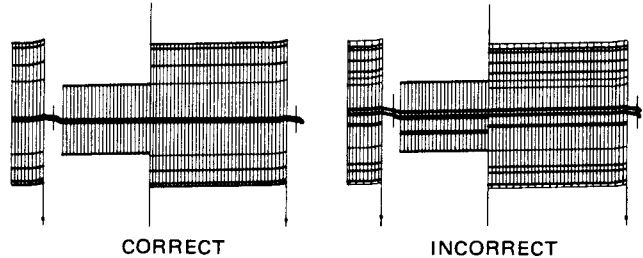
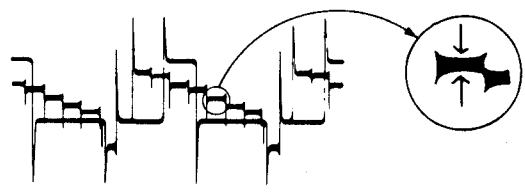
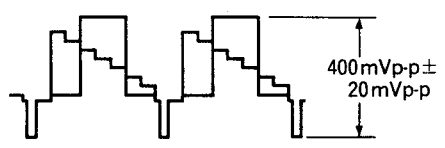
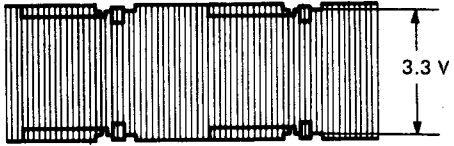
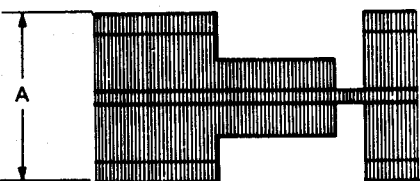
No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	E-E level	VIDEO OUT or TP10	R204	• S-VHS mode • SP mode • E-E • Color bars • SOURCE SEL: AUX	1. Connect an oscilloscope to VIDEO OUT and supply a color bar signal to VIDEO IN. 2. Adjust R204 for 0.97 ± 0.03 Vp-p (75 Ω load).
2	CCD bias-1	TP31	R3	• S-VHS mode • SP mode • E-E • Color bars • SOURCE SEL: AUX	Note: Confirm that the video signal level is 0.97 ± 0.03 Vp-p (75 Ω load) at VIDEO OUT. If necessary, perform the "E-E level" adjustment (Section 2.5.1) before this adjustment. 1. Connect an oscilloscope to TP10 and supply a color bar signal to VIDEO IN. 2. Adjust R3 for maximum output level.
3	CCD bias-2	TP32	R20	• S-VHS mode • SP mode • E-E • Color bars • SOURCE SEL: AUX	1. Connect an oscilloscope to TP32 and supply a color bar signal to VIDEO IN. 2. Adjust R20 for maximum output level.
4	Y NR (NCBAL)	TP21	R28	• S-VHS mode • SP mode • E-E • Color bars • SOURCE SEL: AUX	1. Observe the TP21 waveform at V rate. 2. Adjust R28 for minimum DC step difference (less than 10 mVp-p) 

Fig. 2-5-1

Note: Unless otherwise noted, all test points and adjustments are located on the MAIN board.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
5	COL COMB	TP33	R40	• S-VHS mode • SP mode • E-E • Color bars • SOURCE SEL: AUX	1. Connect an oscilloscope to TP33 and apply a color bar signal to VIDEO IN. 2. Adjust R40 so that the signal center-lines overlap each other (less than 50 mVp-p), in the SP mode.
  Fig. 2-5-2					
6	Y COMB1 and 2	TP34	R45 R48	• N mode • SP mode • E-E • Color bars • SOURCE SEL: AUX	1. Connect an oscilloscope to TP34 and supply a color bar signal to VIDEO IN. 2. Adjust R45 and R48 alternately for minimum chromatic level (less than 50 mVp-p of the magenta portion).
 Fig. 2-5-3					
7	PROCESSOR input level	TP39	R71	• S-VHS mode • SP mode • E-E • Color bars • SOURCE SEL: AUX	1. Connect an oscilloscope to TP39 and apply a color bars signal to VIDEO IN. 2. Adjust R71 for 400 ± 20 mVp-p signal level, in the SP mode.
 Fig. 2-5-4					

Note: Unless otherwise noted, all test points and adjustments are located on the MAIN board.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
8	S mode REC FM level	TP3 (PRE/REC)	R116	• S-VHS mode • EP mode • REC • Color bars • SOURCE SEL: AUX	Note: Connect an oscilloscope GND terminal to TP-GND near the shield case of the PRE/REC board. 1. Connect an oscilloscope to TP3 of the PRE/REC board and record a color bars signal in the EP mode. 2. Adjust R116 for 3.3 ± 0.2 Vp-p pedestal level, between centers of the waveform outline at the pedestal portion.  Fig. 2-5-5
9	N mode REC FM level	TP3 (PRE/REC)	R109	• N mode • EP mode • REC • Color bars • SOURCE SEL: AUX	1. In the same manner as above (Sec. 2.5.8), adjust R109 for 1.9 ± 0.1 Vp-p pedestal level.
10	SP REC Color Level and Balance	TP307	R313	• S-VHS mode • PB mode • MH-1H color bars • SP mode • REC then PB • Color bars • SP mode	Note: Use larger-level waveform for adjustment. 1. Connect an oscilloscope to TP307. Play back a color bar segment of the MH-1H and observe color signal level. 2. Adjust By pressing the + and - tracking buttons of the FRONT panel for maximum level of the color waveform and make a note of the higher color level "A". 3. Set the tracking control of the FRONT panel to the per-set position by simultaneously pressing the + and - tracking buttons. 4. Record and play back a color bar signal. If necessary, before recording, adjust R313 so that the higher level channel becomes 95 to 105% of the noted level "A" during playback. At this time, confirm that the channel difference is within 4 dB.  Fig. 2-5-6

Note: Unless otherwise noted, all test points and adjustments are located on the MAIN board.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
11	EP REC Color Level and Balance	TP307	R314	• S-VHS mode • PB mode • MH-1H color bar • REC then PB • Color bar • EP mode	Note: Perform the EP mode adjustment after completing the SP mode. 1. Connect an oscilloscope to TP307. Play back a color bar segment of the MH-1H and observe color signal level. 2. Adjust by pressing the + and - tracking buttons of the FRONT panel for maximum level of the color waveform and make a note of the higher color level "A". 3. Set the tracking control of the FRONT panel to the per-set position by simultaneously pressing the + and - tracking buttons. 4. Record and play back a color bar signal. If necessary, before recording, adjust R314 so that the higher level channel becomes 110 to 120% of the noted level "A" during playback. At this time, confirm that the channel difference is within 5 dB.
12	S mode PB Y level	VIDEO OUT or TP10	R126	• S-VHS mode • SP mode • REC then PB • Color bars	1. Connect an oscilloscope to VIDEO OUT. 2. Record a color bar signal in the SP mode, then play back. 3. Adjust R126 for 0.97 ± 0.03 Vp-p (75 Ω load).
13	N mode PB Y level	VIDEO OUT or TP10	R131	• N mode • SP mode • REC then • Color bars	1. In the same manner as above (Sec. 2.5.12), adjust R131 for 0.97 ± 0.03 Vp-p (75 Ω load).
14	S mode SP Frequency Response and Balance	TP110	R118 (PRE/REC)	• S-VHS mode • SP mode • REC then PB • Multi-burst or video sweeper	1. Terminate TP110 at 75 Ω load and set sharpness control to center-detent position. 2. Connect a signal generator to VIDEO IN and an oscilloscope to TP110. 3. Record in the SP mode, then play back and set 100 kHz level to 3-scale on the oscilloscope display at CH1 waveform. 4. Adjust R118 (PRE/REC board) so that the 3.58 MHz level becomes 2.4 to 3-scale (-1 ± 1 dB). 5. Confirm that the level difference between both channels is less than 2 dB.

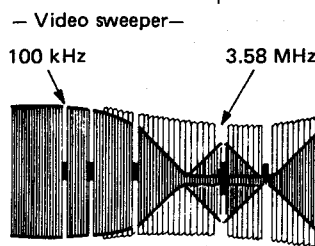
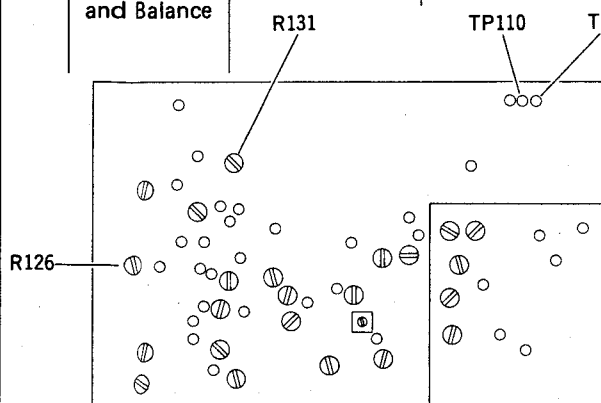
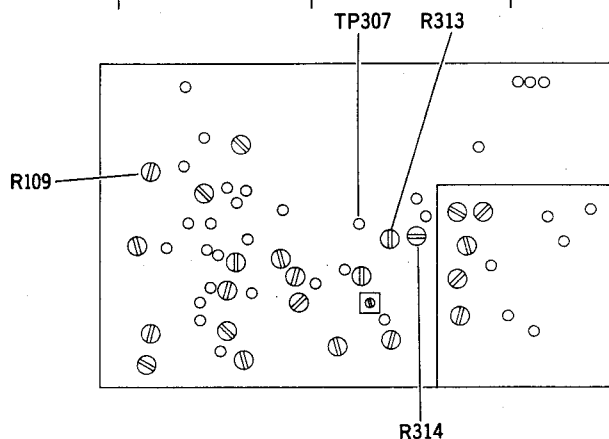


Fig. 2-5-7 (a)

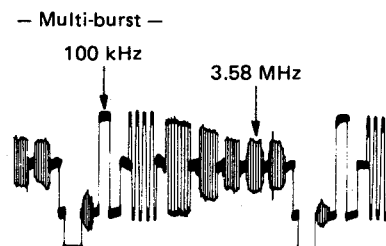
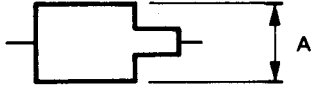
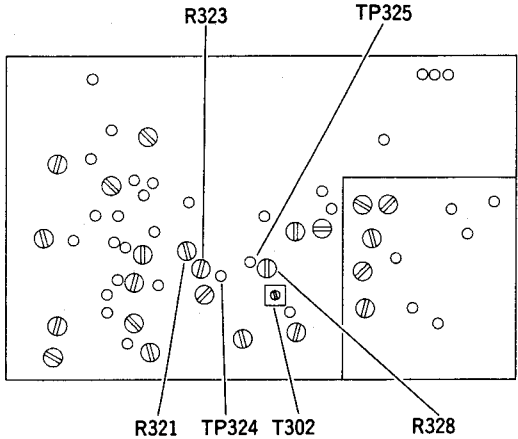
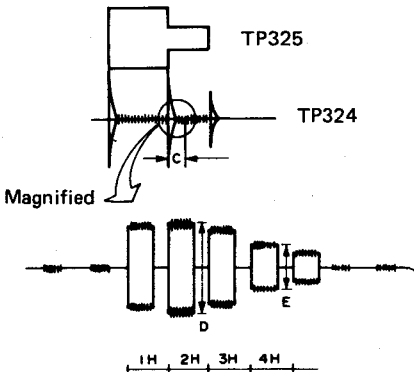


Fig. 2-5-7 (b)

Note: Unless otherwise noted, all test points and adjustments are located on the MAIN board.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
15	S mode EP Frequency Response and Balance	TP110	R101 (PRE/REC)	•S-VHS mode •EP mode •REC then PB •Multi-burst or video sweeper	1. In the same manner as above, (Sec. 2.5.14), perform adjustment for EP mode. 2. Record in the EP mode, then play back and set 100 kHz level to 3-scale on the display at CH1 waveform. 3. Adjust R101 (PRE/REC board) so that the 3.58 MHz level becomes 1.8 to 2.4-scale (-3 ± 1 dB). 4. Confirm that the level difference between both channels is less than 2 dB.
16	C NR input level	TP325	R328	•N mode •SP mode •REC then PB •Color bars •SOURCE SEL: AUX	1. Observe the TP325 waveform at V rate. 2. Adjust R328 so that the color level (A) is 0.27 ± 0.01 Vp-p.  Fig. 2-5-8
17	C NR NC balance	TP324	R323 T302	•N mode •SP mode •PB •MH-1 color bars •EDIT: OFF	1. Observe the TP324 waveform at V rate. 2. Adjust R323 and T302 to minimize the 3.58 MHz level "B", i.e., so that only the noise component is observable as shown in Fig. 2-5-9.  Fig. 2-5-9
18	C NR FB	TP324	R321	•SP mode •PB •MH-1 color bars •EDIT: OFF	1. Short TP21 to TP GND2. Use the controls of the oscilloscope to expand portion C of the TP324 waveform as shown in Fig. 25-10. 2. Adjust R321 so that the maximum 3.58 MHz amplitude D and waveform segment E are related as follows $D : E = 2 : 1 \pm 0.1$ Note: Read p-p value of D and noise center of E.   Fig. 2-5-10

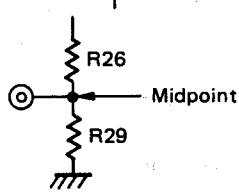
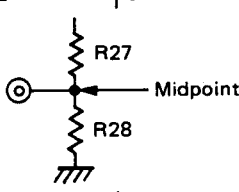
2.6 AUDIO CIRCUIT

Note: Unless otherwise specified, all test points and adjustments are located on the AUDIO board.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	Audio Bias Level	TP31, TP32 (GND)	R9	• N mode • SOURCE Select: AUX • SP mode	1. Connect a millivoltmeter between TP31 and TP32. 2. Set for REC mode without signal. 3. Adjust R9 for 4.0 mVrms.
2	Audio PB Level	AUDIO OUT	R28	• N mode • SOURCE Select: AUX • REC then PB • SP and EP mode	1. Connect an oscilloscope to AUDIO OUT. 2. Supply an audio signal (-8 dBs/1 kHz) to AUDIO IN and record together with a video signal, then play back. 3. Adjust R28 so that the audio output level during playback becomes -6 ± 1 dBs at SP mode (-6 ± 2 dBs at EP mode).
3	REC FM Level	TP53	R69	• S-VHS mode • SP mode • SOURCE Select: AUX • REC then PB • No signal	1. Set the SOURCE SELECT switch to AUX position and record in the SP mode, without an audio signal, then play back. 2. Adjust R69 for 80 mVp-p FM audio play back voltage.
4	E-E Level	AUDIO OUT	R40 (CH1/L) ----- R41 (CH2/R)	• N mode • SOURCE Select: AUX • ALC: OFF • E-E (Stop) mode • AUDIO OUT to Hi-Fi	1. Set the SOURCE SELECT switch to the AUX position. Supply a 1 kHz, -8 dBs audio signal to AUDIO IN and a VIDEO signal to VIDEO IN. 2. Set Hi-Fi REC level controls to detent position. In the E-E (STOP) mode, adjust R40 to obtain -6 ± 0.5 dBs at AUDIO OUT. 3. In the same manner, adjust R41 for the R (CH2) channel.
5	Level Indicator	FDP (Level Ind.)	R15 (Indicator CH1/L) (AUDIO IN/OUT board) ----- R14 (Indicator CH2/R) (AUDIO IN/OUT board)	• N mode • AUX • AUDIO OUT to Hi-Fi • E-E (Stop) mode	Note: Perform the level indicator adjustment after completing the E-E level adjustment (section 2.6, No. 4). 1. Set the SOURCE SELECT switch to the AUX position. Supply a 1 kHz, -8 dBs audio signal AUDIO IN. 2. Set Hi-Fi REC level controls to detent position. In the E-E (STOP) mode, adjust R15 to the point where the FDP level indicators show 0 dB (all white LEDs light). 3. In the same manner, adjust R14 for the R (CH2) channel.

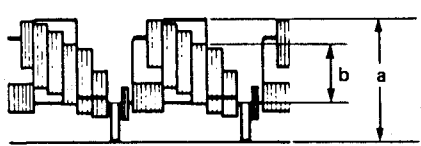
2.7 ON SCREEN CIRCUIT

Note: Unless otherwise specified, all test points and adjustments are located on the ON SCREEN board.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	Character Position	TP1 	C4	• E-E	Note: For below adjustments use 1 : 1 probe with input capacitance less than 100 pF. 1. Connect a frequency counter to TP1 (midpoint of R26 and R29) and GND. Short base of Q2 to ground (emitter) and short the leads of R25. 2. Adjust C4 for 8.7 ± 0.05 MHz without video signal.
2	Back ground Color	TP2 	C14	• E-E	1. Connect a frequency counter to TP2 (midpoint of R27 and R28) and GND. Adjust C14 for 7.15909 ± 0.0001 MHz.

2.8 IF CIRCUIT

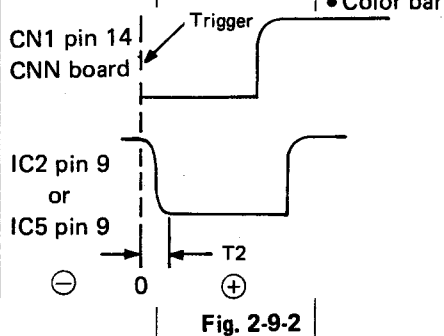
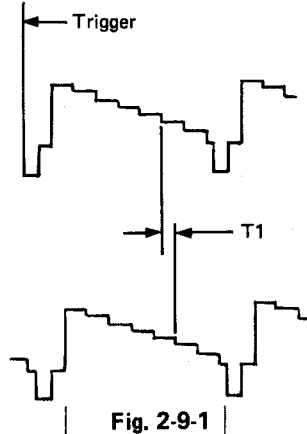
Note: Unless otherwise specified, all test points and adjustments are located on the IF board.

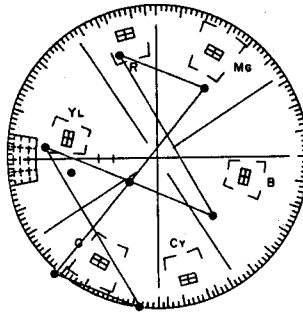
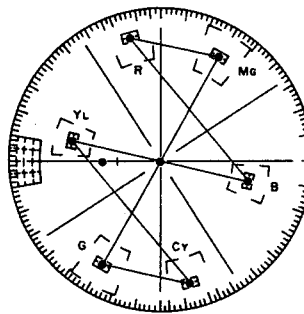
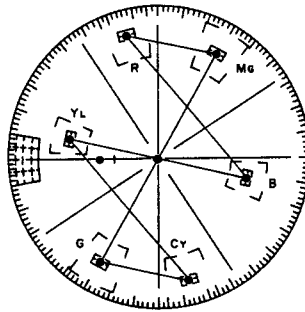
No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	VCO	MONITOR	T2	• TV broadcast • Tuner mode	1. Receive a color broadcast on a VHF-HI channel (7 to 10). 2. Adjust T2 to obtain a fine picture on the monitor.
2	AFC	JP1-5	T3	• TV broadcast • Tuner mode • AFC SW: NORM	1. Receive a color broadcast on a VHF-HI channel (7 to 10). 2. With AFC SW to NORM, connect oscilloscope to pin 5 of JP1. 3. Set the oscilloscope to DC mode and adjust T3 to set the lower edge of the ripple waveform to 4.0 V.
3	Color Level	JP1-12  Y level = 1 Magenta level = 0.45 a : b = 1 : 0.45 Fig. 2-8-1	R40	• TV broadcast • Tuner mode	1. Supply a color bar signal on a VHF-HI channel (7 to 10) from a TV channel signal generator and select the channel corresponding to the generator. 2. With AFC SW OFF, adjust R40 to produce signal waveform as shown in Fig. 2-8-1. Alternate method: 1. Receive a color broadcast on a VHF-HI channel (7 to 10). 2. With AFC SW OFF, adjust R40 so that the magenta level becomes 2/3% of the sync. level.
4	RF AGC	MONITOR	R21	• TV broadcast • Tuner mode	Note: Adjust R21 (RF AGC) to correct for excess noise in the picture or when streaky cross interference occurs due to strong electrical fields. 1. Adjust R21 to minimize noise or streaks on the TV screen. 2. Check for absence of abnormality on all channels.

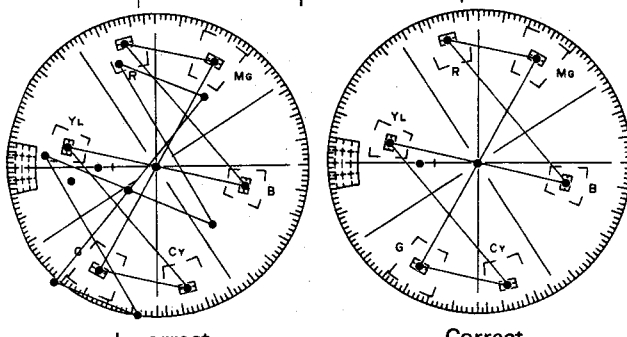
2.9 DIGITAL CIRCUIT

Note: Unless otherwise specified, all test points and adjustments are located on the DIGITAL board.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	Clock	CN1 pin 14 (Y IN) CN1 pin 10 (Y OUT) CNN board	R73	• STROBE 3 mode • Color bar	1. Supply a color bar signal to VIDEO IN, connect one channel of a dual trace oscilloscope to CN1 pin 14 of the CNN board and the other channel to CN1 pin 10 of the CNN board and observe the waveforms. Set the mode and time base of the oscilloscope to ALT mode and 10 μs/div. Trigger the oscilloscope internally (– slope). 2. Align the two waveforms as shown in Fig. 2-9-1 and adjust R73 to set T1 to less than 1 μsec.
2	AFC	CN1 pin 14 CNN board IC2 pin 9 or IC5 pin 9	R30	• E-E • Color bar	1. Supply a color bar signal to VIDEO IN, connect one channel of a dual trace oscilloscope to CN1 pin 14 of the CNN board and the other channel to IC2 pin 9 and observe the waveforms. Set the mode and time base of the oscilloscope to ALT mode and 1 μsec/div. Trigger the oscilloscope internally (– slope). 2. Short IC2 pin 8 to IC2 pin 7 (SWD 5 V). Align the two waveforms (H. SYNC) as shown in Fig. 2-9-2 and adjust R30 to set T2 to less than $0 \frac{-0}{+0.25}$ μsec.
			R66	• E-E • Color bar	3. In the same manner, connect the other channel of a dual trace oscilloscope to IC5 pin 9, and disconnect IC2 pin 8 to IC2 pin 7 (SWD 5 V). Align the two waveforms (H. SYNC) as shown in Fig. 2-9-2 and adjust R66 to set T2 to less than $0 \frac{-0}{+0.25}$ μsec.
3	VCX0	IC4 pin 21	C69 (VCXO)	• E-E • No signal	1. Connect a frequency counter to IC4 pin 21, set for the E-E mode without incoming signal, and short IC4 pin 2 to IC4 pin 18 (SWD 5 V). Adjust C69 for 3.579545 MHz $\pm$ 50 Hz.
		IC1 pin 18	C19 (VCXO)		2. Connect the frequency counter to IC1 pin 18, set for the E-E mode without incoming signal, and short IC1 pin 2 to IC1 pin 15 (SWD 5 V). Adjust C19 for 3.579550 MHz $\pm$ 50 Hz.

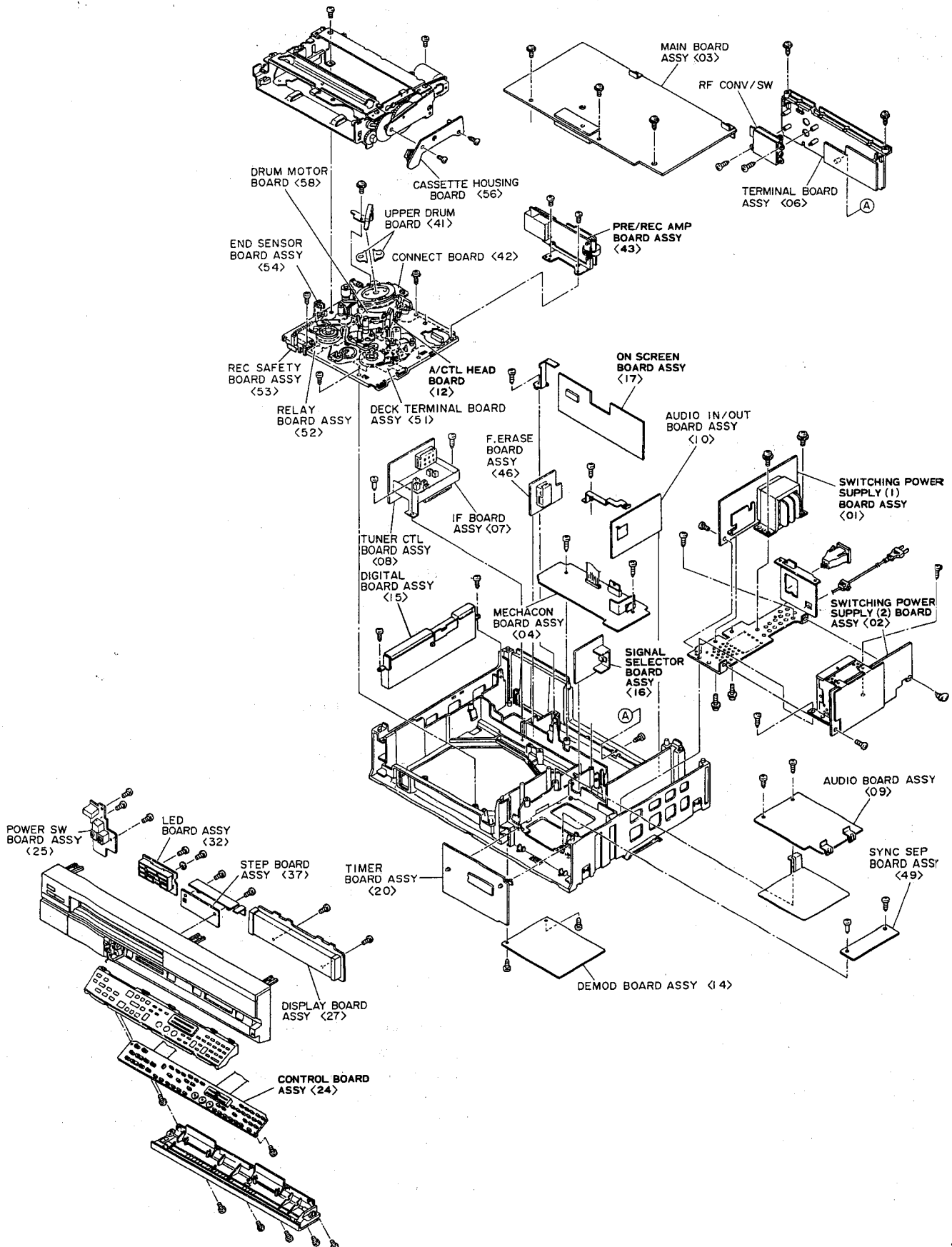


No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
4	Carrier Balance	VIDEO OUT	R37 (CARR. BAL.) R49 (CARR. BAL.)	• STROBE 3 mode • Color bar	1. Supply a color bar signal to VIDEO IN, connect a vectorscope to VIDEO OUT via a TV-monitor and observe the pairs of color dots on the vectorscope. 2. Set for the STROBE 3 mode, adjust R37 and R49 to observe the center of dot at the center of the display as shown in Fig. 2-9-3.   Incorrect Correct Fig. 2-9-3 R37 (CARR. BAL.) R49 (CARR. BAL.) • STROBE 3 mode • Color bar • Alternate method 1. Supply a color bar signal to VIDEO IN, connect one channel of a dual trace oscilloscope to Q3 (base) and the other channel to Q4 (base). Set the mode of the oscilloscope to X-Y mode. 2. In the E-E mode, observe the pairs of color dots on the oscilloscope and TV-monitor color bar. 3. Set for the STROBE 3 mode, alternately adjust R37 and R49 to align the pairs of color dots on the oscilloscope and TV-monitor color bar with that obtained in E-E mode. Note: Repeat the above steps (2 and 3) several times.
5	Burst Level	VIDEO OUT	R48 (BURST LEVEL)	• STROBE 3 mode • Color bar	1. Supply a color bar signal to VIDEO IN, connect an oscilloscope to VIDEO OUT and observe the waveform on the oscilloscope. 2. Set for the STROBE 3 mode, adjust R48 so that the burst level becomes 0.24 Vp-p.
6	Color Difference Balance, Color Level and Phase	VIDEO OUT	R20 (LEVEL) R23 (PHASE) R36 (COLOR DIF.)	• STROBE 3 mode • Color bar	1. Supply a color bar signal to VIDEO IN, connect a vectorscope to VIDEO OUT via a TV-monitor and observe the waveform on the vectorscope. 2. In the E-E mode, set the vectorscope for 15% color bar saturation as shown in Fig. 2-9-4. Set for the STROBE 3 mode and adjust R20, R23 and R36 to align the vectorscope waveform (Phase, Level to less than ±10%, 20%) with that obtained in the E-E mode.  Fig. 2-9-4

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
			R20 (LEVEL) R23 (PHASE) R36 (COLOR DIF.)		• Alternate method 1. Supply a color bar signal to VIDEO IN, connect one channel of a dual trace oscilloscope to LPF1 pin 3 and the other channel to LPF2 pin 3. Set the mode of the oscilloscope to X-Y mode. 2. In the E-E mode, observe the pairs of color dots on the oscilloscope and TV-monitor color bar. 3. Set for the STROBE 3 mode, alternately adjust R20, R23 and R36 to align the pairs of color dots on the oscilloscope and TV-monitor color bar with that obtained in the E-E mode. Note: Repeat the above steps (2 and 3) several times.
7	Picture In Picture Phase (PIP)	VIDEO OUT	R59	• P IN P mode • Color bar • PB • MY-1 color bar	1. Supply a color bar signal to VIDEO IN, connect a vectorscope to VIDEO OUT via a TV-monitor and set the vectorscope for 75% color bar saturation as shown in Fig. 2-9-4. Play back the color bar segment of MH-1 alignment tape. 2. Set for the picture in picture mode, adjust R59 to align picture in picture phase as shown in Fig. 2-9-5.
		 Incorrect Correct		Fig. 2-9-5	• Alternate method 1. Supply a color bar signal to VIDEO IN, observe the TV-monitor. 2. Play back the color bar segment of MH-1 alignment tape. Set for the picture in picture (PIP) mode, adjust R59 to align phase of inserted picture with main picture.

SECTION 3 CHARTS AND DIAGRAMS

3.1 CIRCUIT BOARD LOCATIONS



3.2 GENERAL INFORMATION

3.2.1 Connections

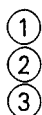
Note:

Unless otherwise specified, only signal input flow is indicated.

Connection arrows indicate only signal outputs.



: Connector



: Direct connection



: Board in connector



: Connected pattern in the board.
Abbreviations



V : Video M : Mechacon



S : Servo A : Audio

VS : Signal flow from
video to servo.

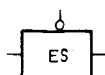
3.2.2 Indications

AUX : Active only at high.

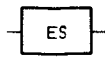
AUX : Active only at low.

AUX : Active only at middle.

AUX : Active only at open.



: Active only at low for
electronic switch.



: Active only at high for
electronic switch.



: Low pass filter.



: High pass filter.



: Band pass filter.



: Limiter.



: Detector

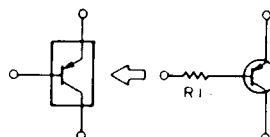
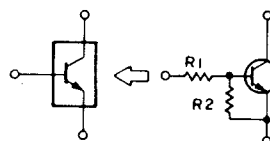


: Amplifier.



: Mixer stage.

3.2.3 Digital transistor



DTA114T
T mark only

Note:

The digital transistor includes built in resistors.
It features small size and high reliability.
Both PNP and NPN types are available.

Uses:

Inverter, Interface, driver circuits.

3.2.4 Signal flow in the schematic



Recording signal path



Playback signal path



REC/PB signal path

3.2.5 Schematic diagram values

Unless otherwise specified.

1. All resistance values are in ohms, 1/6 W, 1/8 W, (refer to parts list).
2. All capacitance values are in μF , (P; PF).
3. All inductance values are in μH , (m; mH).
4. All diodes are 1SS133 or MA165, (refer to parts list).
5. Voltages are DC-measured (reference to ground) with a digital voltmeter during recording (SP with S-VHS mode) and playback (SP with S-VHS mode) with alignment tape. Where voltages differ between recording and playback, the voltage during playback is shown in parentheses.
6. Waveforms (VIDEO System) are measured (reference to ground) with a color bar during recording (SP with S-VHS mode) and playback (SP with S-VHS mode) with alignment tape.
7. Waveforms (AUDIO System) are measured (reference to ground) with 1 kHz (-8 dBs) during recording and playback with alignment tape (1 kHz).
8. Shaded () parts are critical for safety.
Replace only with specified parts numbers.

3.3 ABBREVIATIONS USED IN THE SCHEMATIC DIAGRAM

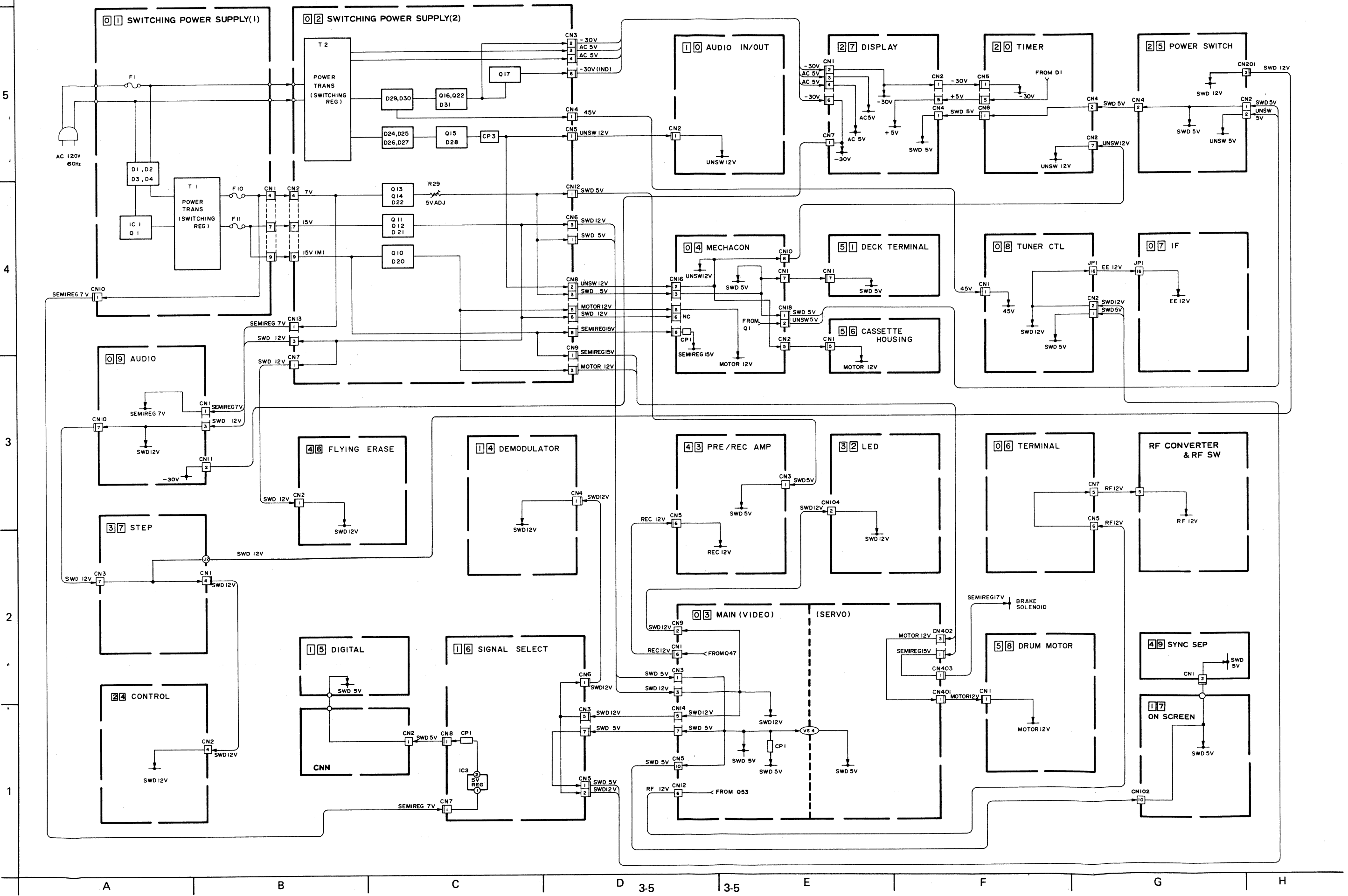
A	AC	: Alternating Current	C	CONN	: Connector	I	INS	: Insert	R	RPT	: Repeat
	ACC	: Automatic Color Control		CONV	: Converter		INT	: Internal, Interrupt		RS FF	: RS Flipflop
A	A/CTL	: Audio/Control	C	CP	: Circuit Protector	I	INV	: Inverter	R	RST	: Reset
	ADC	: Analog to Digital Converter		CP	: Clamp Pulse		I/O	: Input/Output		RT	: Rotary Transformer
A	ADD	: Adder	C	CPC	: Capstan Phase Control	I	IR	: Infrared	R	RUN	: Running
	ADJ	: Adjustment		CPU	: Central Processing Unit	L				RY	: Relay
A	A DUB	: Audio Dubbing	C	CTL	: Crosstalk Cancel	L	L	: Low, Left	S	SAW	: Sawtooth, Surface Acoustic Wave
	AE	: Audio Erase		CTL	: Control		LCD	: Liquid Crystal Display		SC	: Subcarrier, Simulcast
A	AEF	: Automatic Editing Function	D	D	: Drum, Digital, Diode, Drain	L	LED	: Light Emitting Diode	S	SCH	: Search
	AFC	: Automatic Frequency Control	D	DAC	: Digital to Analog Converter		LIM	: Limiter		SEL	: Select, Selector
A	AFT	: Automatic Fine Tuning		dB	: Decibel	L	LIN	: Linearity	S	SENS	: Sensor
	AGC	: Automatic Gain Control	D	DC	: Direct Current		LLD	: Low Light Detector		SEP	: Separator
A	AH	: Audio Head		DD	: Direct Drive	L	LOAD	: Loading (Cassette)	S	SF	: Source Follower
	AHD	: Audio High Density Disk	D	DEC	: Decoder		LP	: Long Play		SFF	: Short Fast Forward
A	AL	: After Loading		DEM	: Demodulator	L	LPF	: Lowpass Filter	S	SIF	: Sound Intermediate Frequency
	ALC	: Automatic Light Compensation	D	DEM	: Demultiplexer	L	LSB	: Lower Sideband		SN	: Signal to Noise Ratio
A	ALM	: Alarm		DET	: Detector	M	M	: Motor, Mega	S	SOL	: Solenoid
	ALU	: Arithmetic Logic Unit	D	DEV	: Deviation		MAX	: Maximum		SOS	: Sound on Sound
A	AM	: Amplitude Modulation		DFRS	: Drum Free Running Stop	M	MDA	: Motor Drive Amplifier	S	SP	: Standard Play
	AMP	: Amplifier	D	DG	: Differential Gain		MECHACON	: Mechanism Control		SR	: Supply Reel
A	ANT	: Antenna		DIF	: Differential	M	MIC	: Microphone	S	SREW	: Short Rewind
	APC	: Automatic Pedestal Control	D	DISCR	: Discriminator		MIN	: Minimum		S/S	: Slow/Still
A	APC	: Automatic Phase Control		DL	: Delay Line	M	MIX	: Mixer, Mixing	S	SSG	: Sync Signal Generator
	APL	: Average Picture Level	D	DOC	: Dropout Compensator		MMV	: Monostable Multivibrator		SSNS	: Start Sensor
A	A/S/M	: Audio/Servo/Mechacon		DOD	: Drop Out Detector	M	MNOS	: Metal Nitride Oxide Semiconductor MNOS	S	STD	: Strobe Data, Standard
	ASS'Y	: Assembly	D	DP	: Differential Phase		MOD	: Modulation, Modulator		SUP	: Supply
A	ATT	: Attenuator		DPC	: Drum Phase Control	M	MODEM	: Modulator-Demodulator	S	SW	: Switch
	AUD	: Audio	D	DYAC	: Dynamic Aperture Control		MON	: Monitor		SWD	: Switched
A	AUTO	: Automatic	E	E	: Edit, Emitter	M	MOS	: Metal Oxide Semiconductor	S	SYNC	: Synchronization
	AUX	: Auxiliary		EDP	: Electronic Data Processing		MPX	: Multiplexer, Multiplex		SYSCON	: System Control
B	B	: Bas, Blue	E	E-E	: Electric to Electric	M	MS	: Mode Select	T	TAL	: Tally
	BAL	: Balance		EF	: Emitter-Follower		MUT	: Muting		TBC	: Time Base Corrector
B	BATT	: Battery	E	EMP	: Emphasis	N	NAND	: Not-And	T	TC	: Tension Control, Time Code
	BBD	: Bucket Brigade Device		EN	: Enable		NC	: Not Connected, Normally Closed		TEN	: Tension
B	BCD	: Binary Coded Decimal	E	ENC	: Encoder	N	NFB	: Negative Feedback	T	TF	: Thermal Fuse
	BEG	: Beginning		ENV	: Envelope		NLN	: Non-Linear		TIM	: Timing
B	BF	: Behind Focus	E	EOT	: End of Tape	N	NO	: Normally Open	T	TK	: Tracking
	BFP	: Burst Flag Pulse		EP	: Extended Play	N	NOR	: Normal, Not-Or		TNR	: Tuner
B	BIT	: Binary Digit	E	EQ	: Equalizer		NR	: Noise Reduction	T	TP	: Test Point
	BLK	: Black, Blanking	E	ES	: Electronic Switch	O	OP	: Operation		TPZD	: Trapezoid
B	BLU	: Blue		ESNS	: End Sensor		OPAMP	: Operational Amplifier	T	TR	: Transistor, Trimmer
	BNC	: Bayonet Connector	E	EXP	: Expander	O	ORN	: Orange		TRANS	: Transformer
B	BOT	: Beginning of Tape		EXT	: External		OSC	: Oscillator	T	T/T	: Tuner/Timer
	BPF	: Bandpass Filter	F	F	: Farad, Fuse	O				TU	: Take-up
B	BRK	: Brake		F ADV	: Frame Advance	P	PB	: Playback	U	UL	: Unloading
	BRN	: Brown	F	FDP	: Fluorescent Display Panel		PC	: Photocoupler, Pulse Counter		UNREG	: Unregulated
B	BRT	: Brightness		FE	: Full Erase	P	PCM	: Pulse Code Modulation	U	UNSW	: Unswitched
	BT	: Band Tuning	F	FET	: Field Effect Transistor	P	PG	: Pulse Generator	V	V	: Vertical, Volt
B	BUFF	: Buffer		FF	: Fast Forward, Front Focus Flipflop		PGM	: Program		VACT	: Video Action
	BW or B/W	: Black and White	F	FG	: Frequency Generator	P	PI	: Photo Interrupter	V	VCO	: Voltage Controlled Oscillator
C	C	: Capacitance, Collector, Color		FM	: Frequency Modulation		PIF	: Picture Intermediate Frequency		VD	: Vertical Drive
	CAL	: Calibration	F	FMA	: FM Audio	P	PLA	: Programmable Logic Array	V	VIF	: Video Intermediate Frequency
C	CAP	: Capstan, Capacitor		FR	: Full Recording, Frame, Fusible Resistor		PLL	: Phase Locked Loop		VLT	: Violet
	CAR	: Carrier	F	FREQ	: Frequency	P	POS	: Position	V	VR	: Variable Resistor
C	CARR	: Carrier		F-V CONV	: Frequency to Voltage Converter		p-p	: Peak-to-Peak		VS	: Video and Sync
	CASS	: Cassette	F	FWD	: Forward	P	PR	: Pinch Roller	V	VSC	: Variable Search
C	CC	: Cassette Compartment		FWD S	: Forward Search		PREAMP	: Preamplifier		V/T	: Video/Television
	CCD	: Charge Coupled Device	G	G	: Green, Gate, Grid	P	PRL	: Preroll	V	V/U	: VHF/UHF
C	CCT	: Circuit		GEN	: Generator		P/S	: Pause/Still		VX0	: Variable Crystal Oscillator
	CdS	: Cadmium Sulphide	G	GND	: Ground	P	PSC	: Pulse Swallowing Control	W	W	: Watt
C	CD	: Count Down		GRN	: Green		PU	: Pickup		WARN	: Warning
	CE	: Chip Enable	G	GRY	: Gray	P	PUT	: Programmable Unijunction Transistor	W	W & D	: White and Dark
C	CF	: Ceramic Filter, Color Frame, Correct Focus		H	: High, Henry, Hour		PWB	: Printed Wiring Board		WHT	: White
C	CH	: Channel	H	HBF	: Horizontal Burst Flag	P	PWM	: Pulse Width Modulation	W	WV	: Working Voltage
	CHG	: Charge		HD	: Horizontal Drive	P	PWR	: Power		X	: XTAL : Crystal
C	CHROMA	: Chrominance	H	HG	: Hall Generator	R	R	: Red, Right	Y	Y	: Luminance
	CLK	: Clock		HPF	: Highpass Filter		RA	: Resistor Array		YEL	: Yellow
C	CLR	: Clear	H	Hz	: Herz	R	RAM	: Random Access Memory	Y		
	CMD	: Command	I	IC	: Integrated Circuit		REC	: Recording			
C	CMOS	: Complementary Metal Oxide Semiconductor		ID	: Identification (Pulse)	R	REF	: Reference	Y		
			I	IF	: Intermediate Frequency		REG	: Regulated, Regulator			
C	CNT	: Count, Counter		IFR	: Infrared	R	REM	: Remote	Y		
	COL	: Color	I	IFT	: Intermediate Frequency Transformer		REMOCON	: Remote Control (Unit)			
C	COM	: Common		IND	: Indicator	R	REV	: Reverse	Y		
	COMB	: Combination	I	INH	: Inhibit		REV S	: Reverse Search			
C	COMP	: Comparator				R	REW	: Rewind	Y		
		: Composite Compensation	I				RF	: Radio Frequency			
C						R	ROM	: Read Only Memory	Y		
							R/P	: Record/Playback			

3.4 MAIN TYPES OF ACTIVE AND PACKAGE CIRCUITS

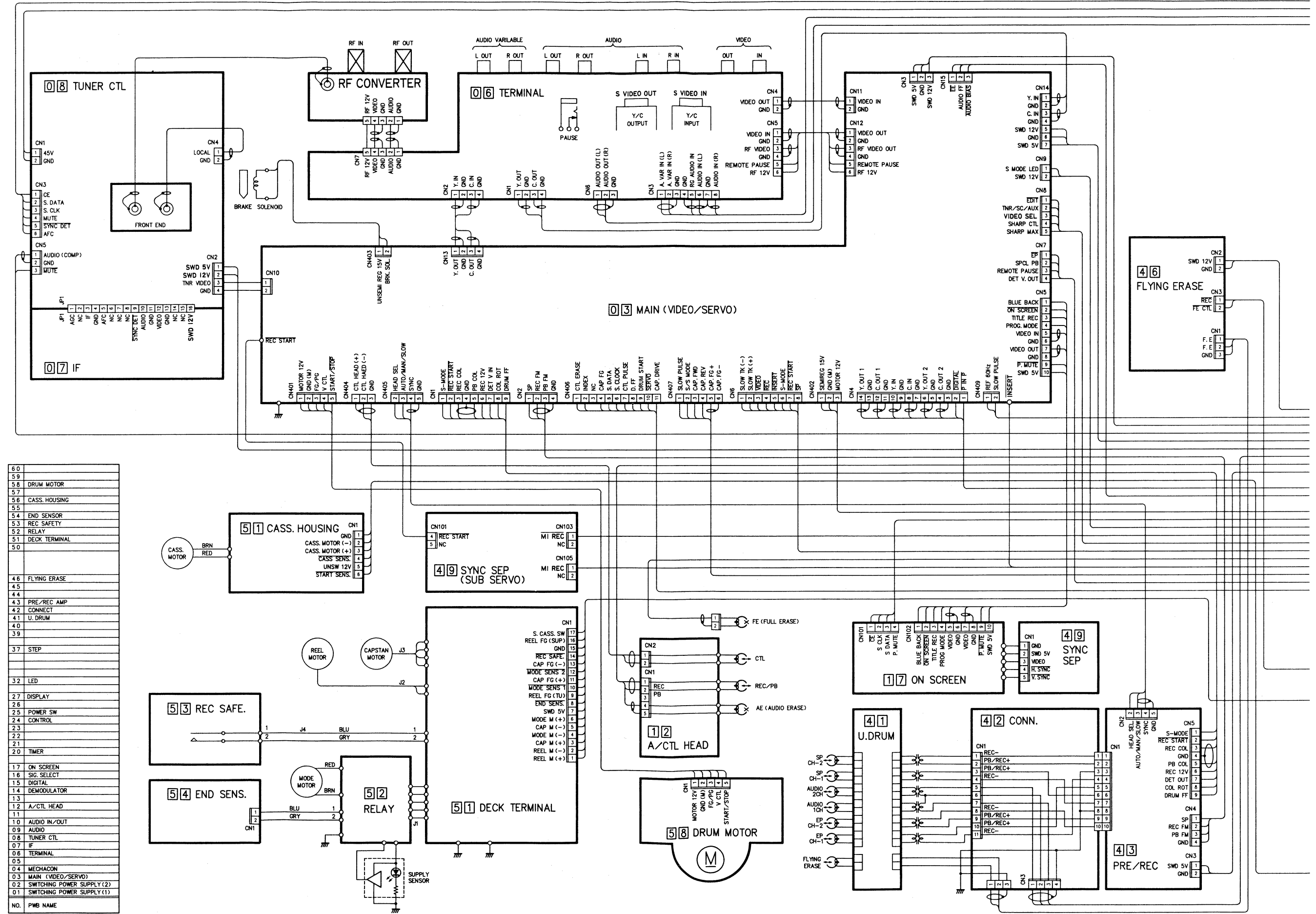
	Integrated Circuit		Transistor		Diode
	A	B	C	D	E
1					
2					
3					
4					
5					
6					
7					
8					

NAME			L	NAME			L	NAME			L	
IC				T	TA7361AP TC74HC4053AF TD6358P TD62003F	5A 9B 1B 8B	DIODE					
A	AN3211NK AN3380NK AN3926K AN6392	1B 1B 1B 5A		V	VC2034 VC2034-2	8A 8A	A	AU01Z		3E		
B	BA6222 BA6259N BA7001 BA7021 BA7057 BA7233 BU2767S BU2768N BU4013B BU4030B BU4030BF	9A 6A 4B 4B 2A 2A 2A 6A 2A 2A 8B		TRANSISTOR				D	DA210S DAN202K DAP209S	3E 3E		
			DTA	DTA114ES DTA114TS DTA124EK DTA124ES DTA144EF DTA144ES	4C 3D 1C 4C 2C 4C	F	F5KQ40B F6P20F FMB-24 FML-12S	5E 5E 5E 5E				
						G	GL-3EG43	1E				
						H	HZ2BLL HZ6A3 HZ30-2L HZS4.3EB2 HZS33EB1 HSS101-01	4E 4E 4E 4E 4E 3E				
						L	LTZ-MR15	2E				
						M	MA27W(B) MA165 MTZ4.3A MTZ6.8B MTZ7.5C MTZ8.2A MTZ10A MTZ10B MTZ13C MTZ20C	3E 3E 4E 4E 4E 4E 4E 4E 4E				
						O	OA90	3E				
						R	RD6.2ES-T1B2 RD8.2ESB2 RD9.1ES-T1B2 RU1A	4E 4E 4E 3E				
						S	SLH-34VC3F SLR-34MC3F SLR-34VC3F SLV-31MC3F	1E 1E 1E 1E				
						U	UZ8.2BSC	4E				
C	CXA1126S	1A	DTB	DTB114ES	4D							
H	HA118019NT HD49712ANT	2B 1A	DTC	DTC114ES DTC124ES DTC143ES DTC143TS DTC144EF DTC144EK DTC144ES DTC144WS	4C 4C 4C 3D 2C 1C 4C 4C							
I	IC-PST523H-2	7B										
L	LA7220	1B										
M	M5M4C500L M5218P M5278L56 M50255P M50601P M50747E-897FP M50938-600 M51271FP M51272FP M51279FP M51365SP M51647SP M52678FP M52679FP M54647L M65011FP MB89010A-108 MN1220 MN3106 MN3801 MSC1146RS MSC7112-01SS	5B 3A 7B 2A 2A 7A 2B 8B 8B 8B 1B 1B 8B 8B 6B 7A 2A 1B 3A 1B 2A 1A			DTD	DTD114ES	3D					
			U	UN4112 UN4212	2C 4C							
			2SA	2SA720 2SA854S 2SA933S 2SA1037K 2SA1309 2SA1309S 2SA1346	5C 4C 4C 1C 4C 4C 4C							
			2SB	2SB911 2SB1068 2SB1186	3C 4D 2D							
			2SC	2SC536SPA 2SC1317S 2SC1740S 2SC1741S 2SC2021 2SC2412K 2SC3311 2SC3354 2SC3399 2SC3400	4C 5C 4C 4C 2C 1C 4C 2C 4C 4C							
			2SD	2SD636 2SD1423 2SD1450 2SD1468S 2SD1764 2SD1796	2C 4C 4C 4C 2D 2D							
			N	NJM2217L NJM2220S	2A 5B							
			P	PB20166D PB20167B-02 PB20187A PU22517D	3B 3B 4A 3B							
			U	UPC78N05 UPC319C UPC393C UPC7805H UPD74HC00G UPD75P108CN-018 UPD4053BC UPD75108CW-099 UPD75216ACW-058	1B 3A 8B 1B 1B 1B 1B							

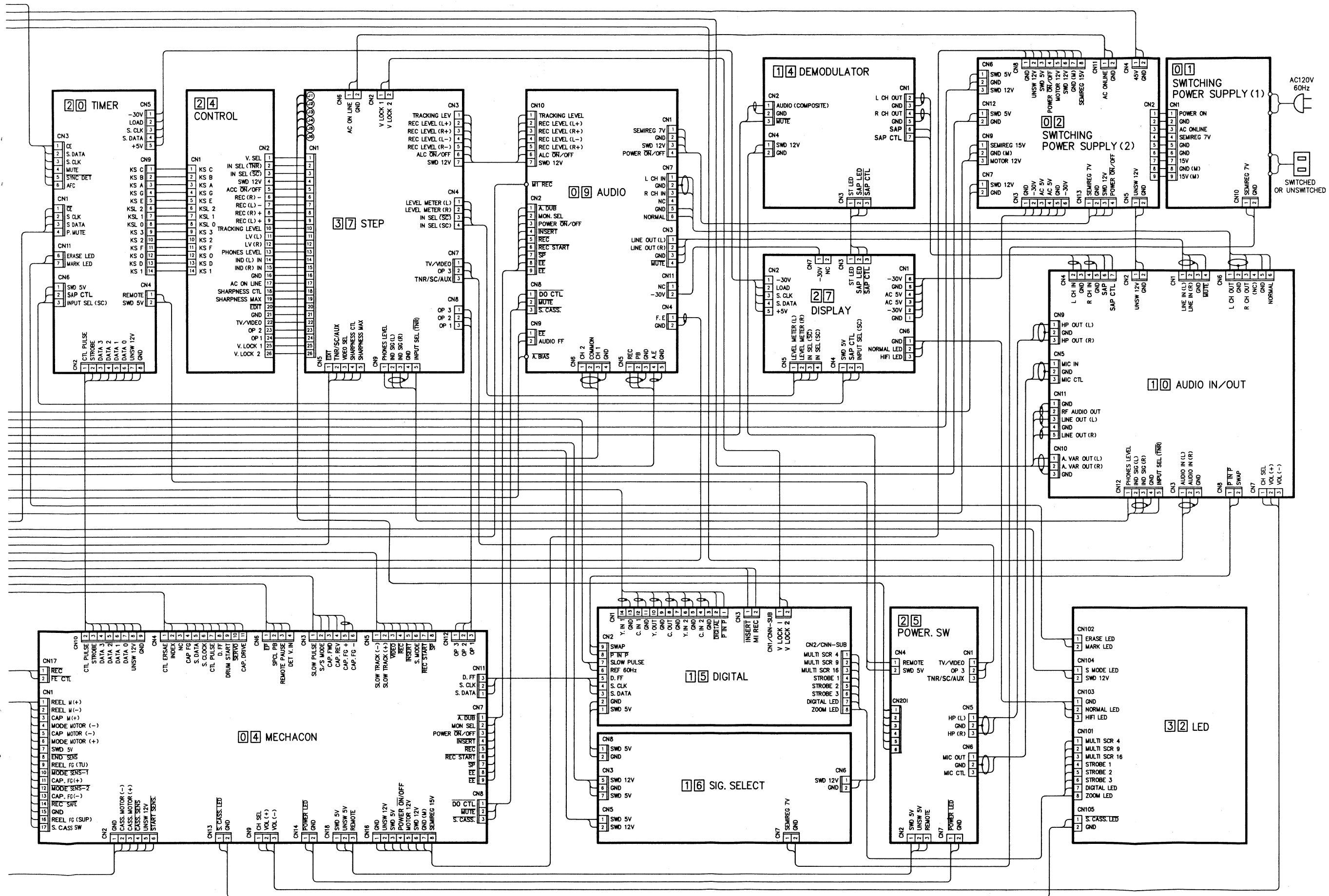
6 3.5 POWER SYSTEM BLOCK DIAGRAM



3.6 BOARD INTERCONNECTION DIAGRAM



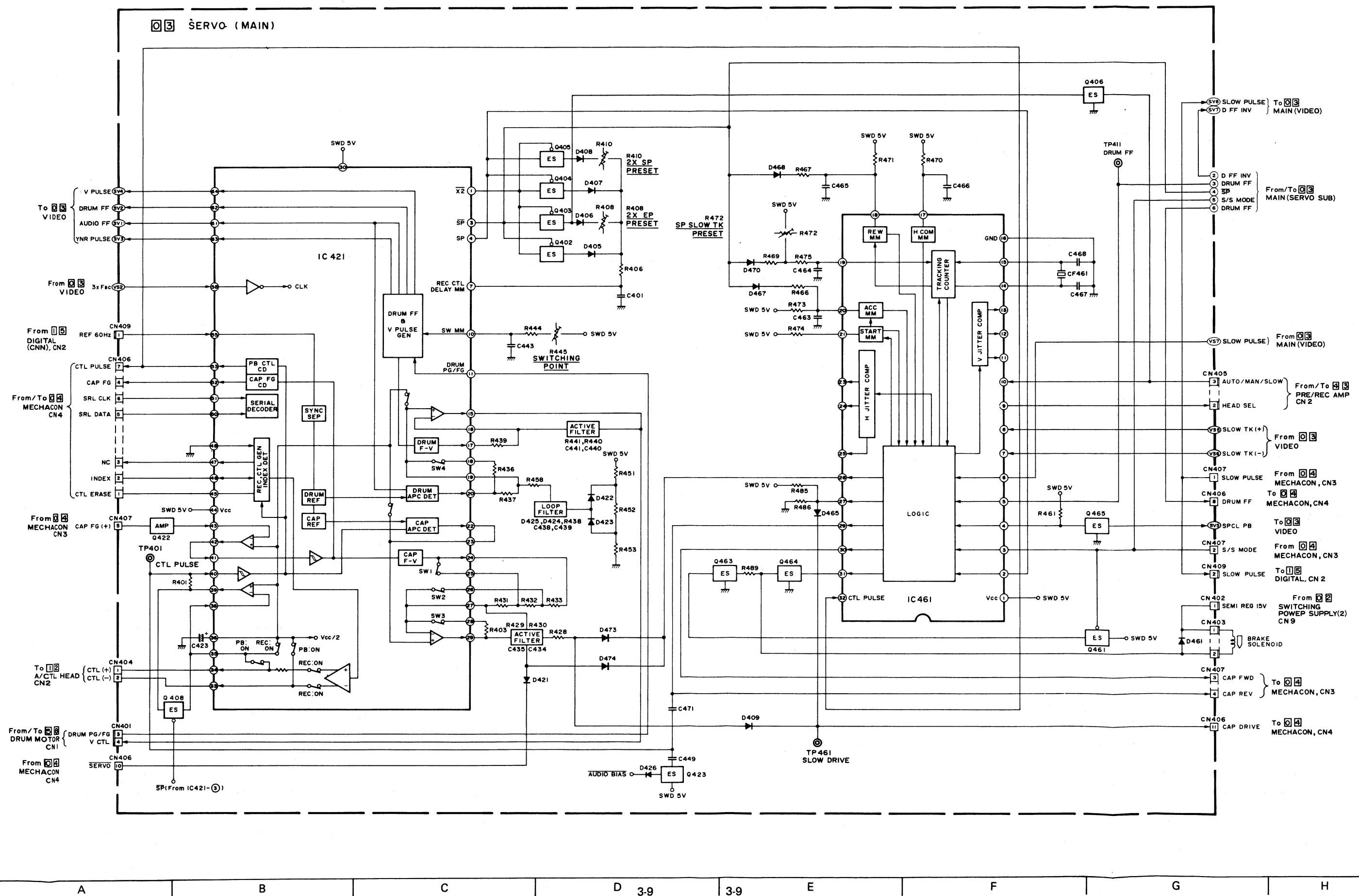
A B C D E F G H



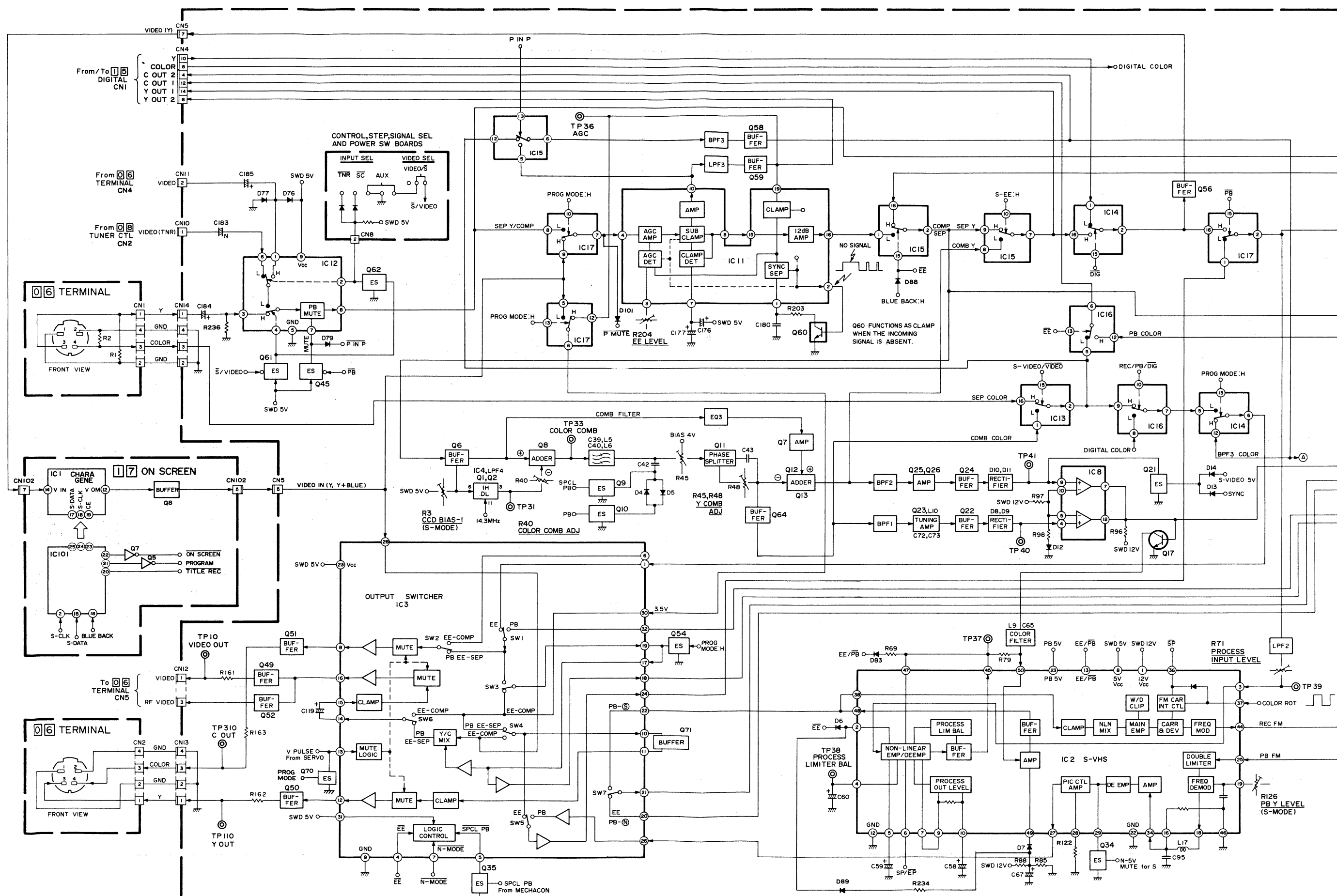
6



3.8 SERVO BLOCK DIAGRAM



3.9 VIDEO BLOCK DIAGRAM



A

B

C

3-10 D

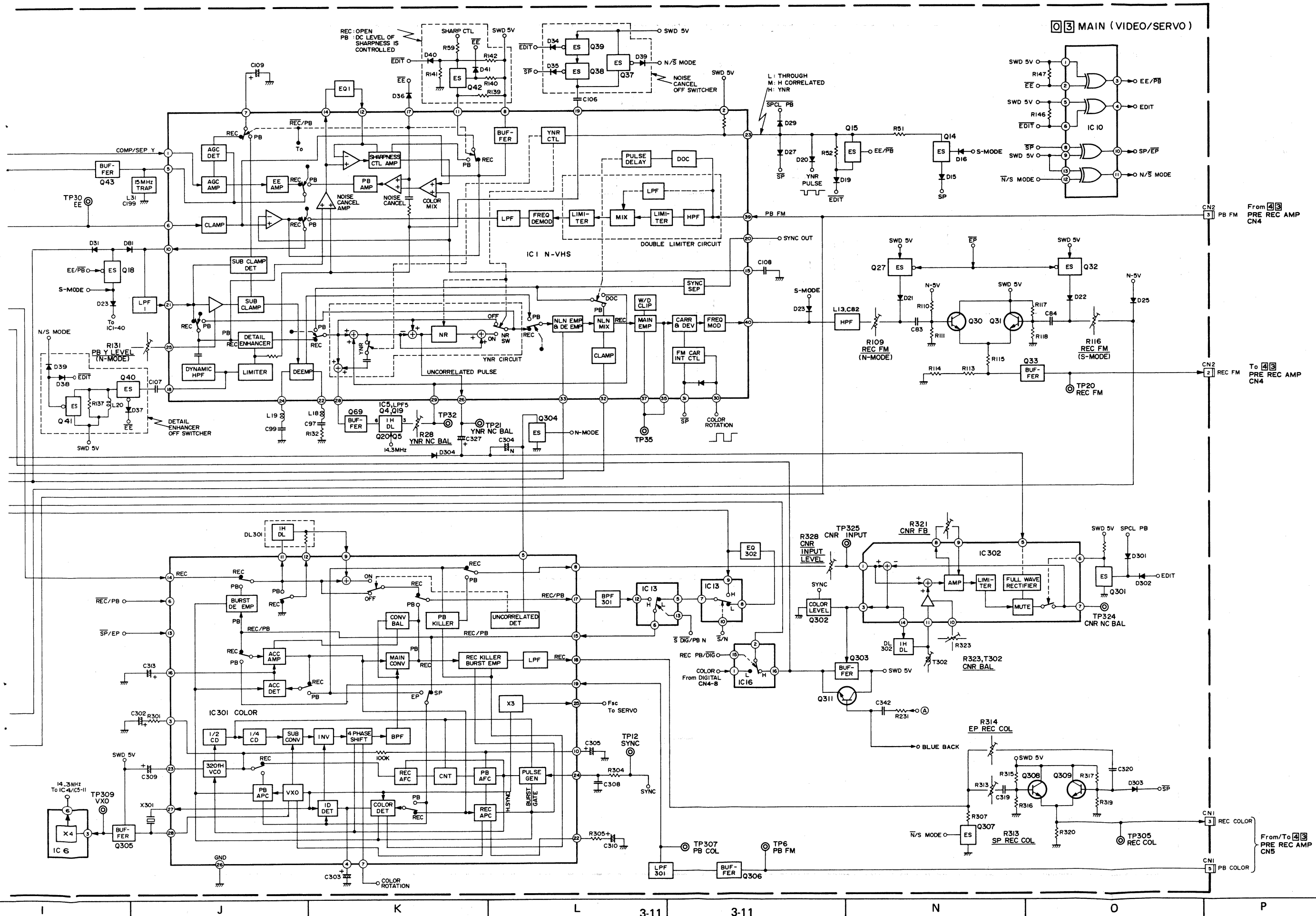
3-10 E

E

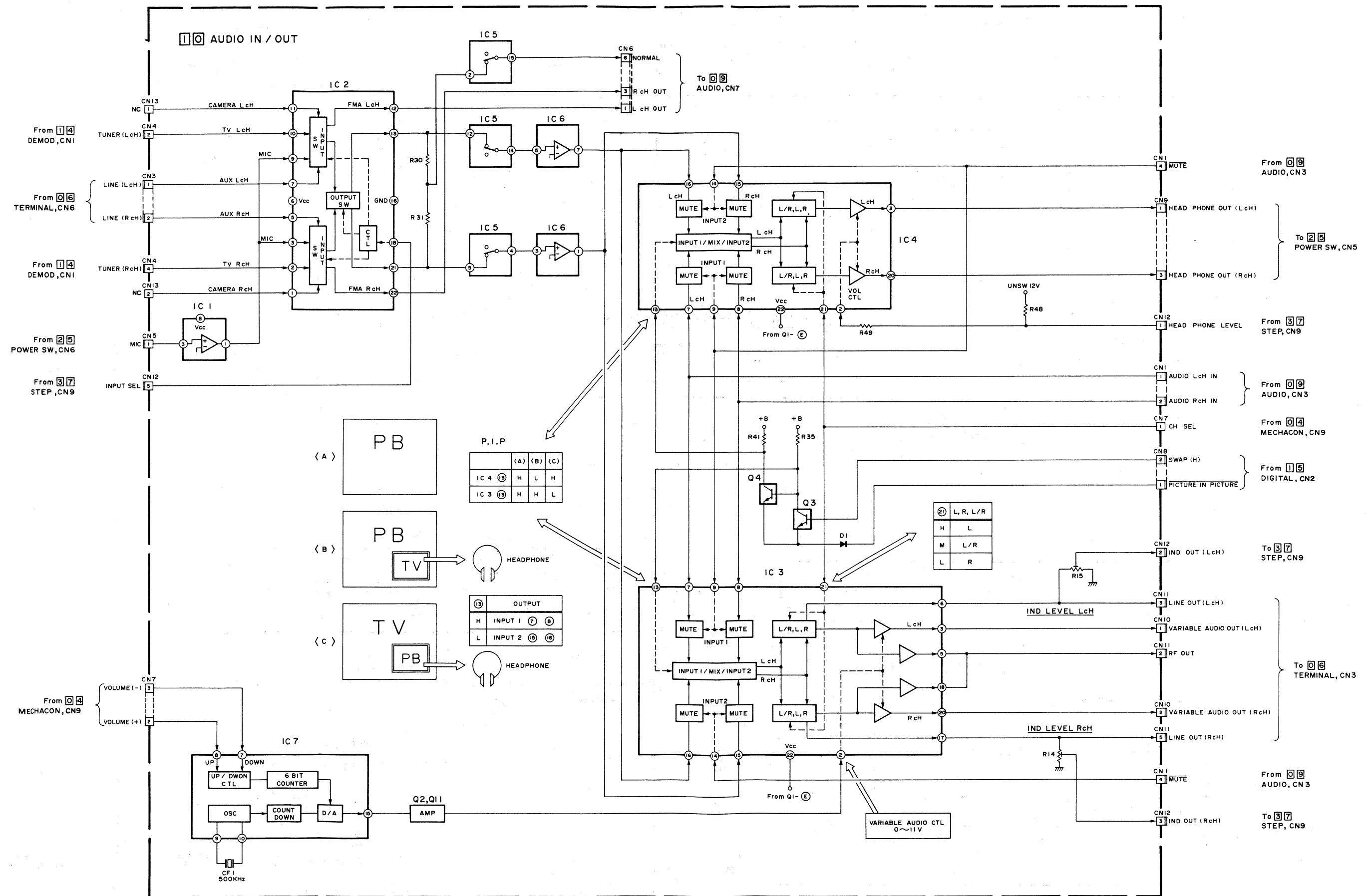
F

G

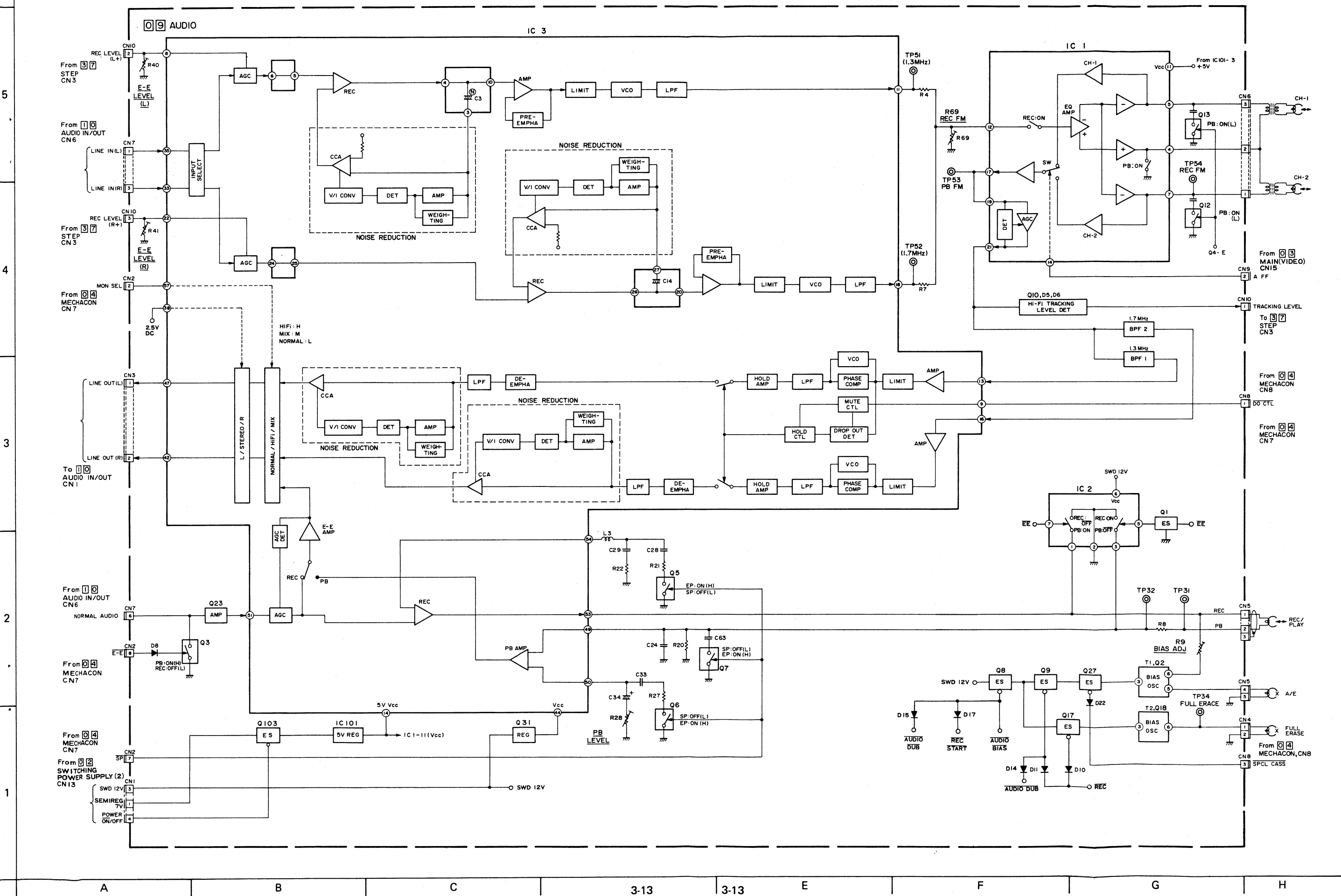
H

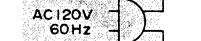
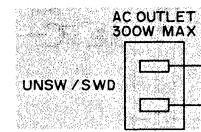


3.10 AUDIO IN/OUT BLOCK DIAGRAM



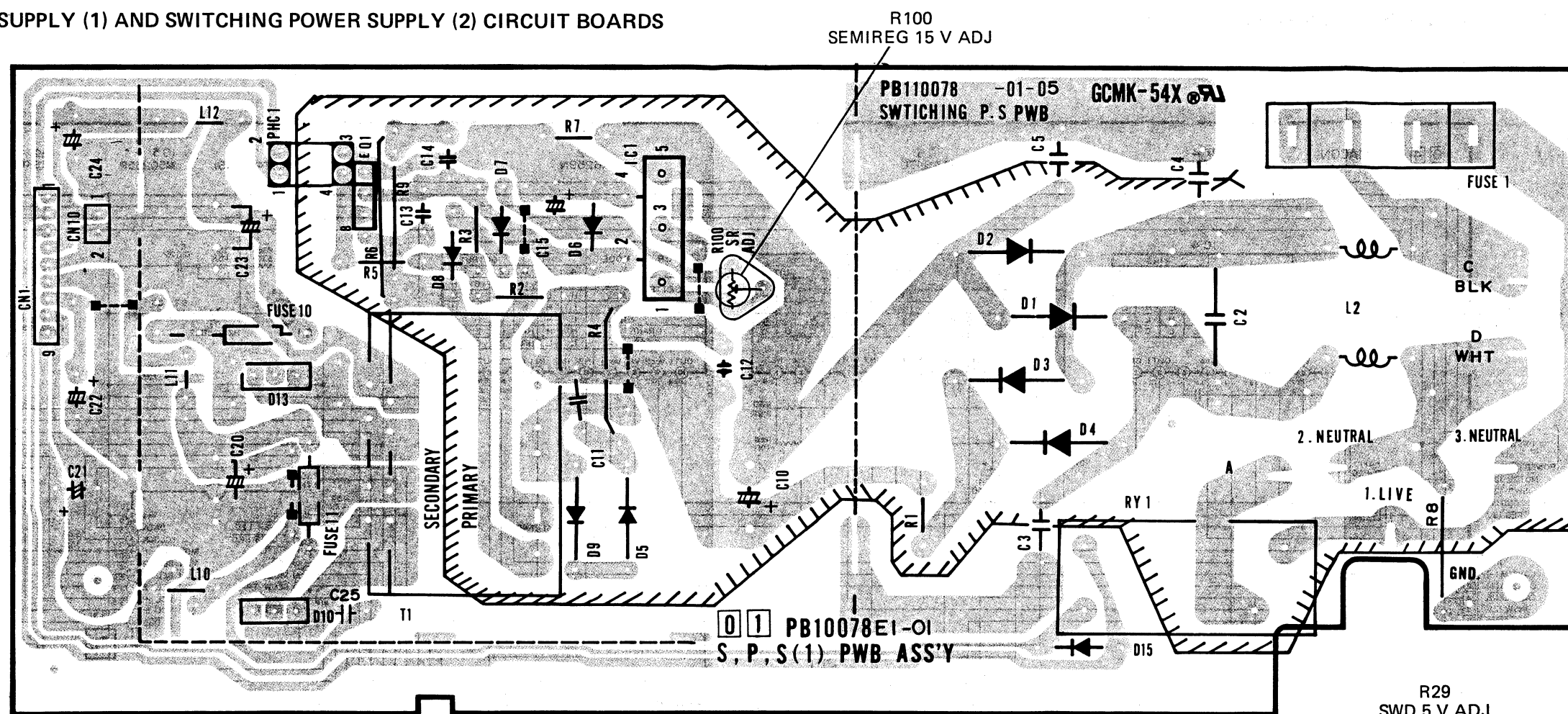
3.11 AUDIO BLOCK DIAGRAM



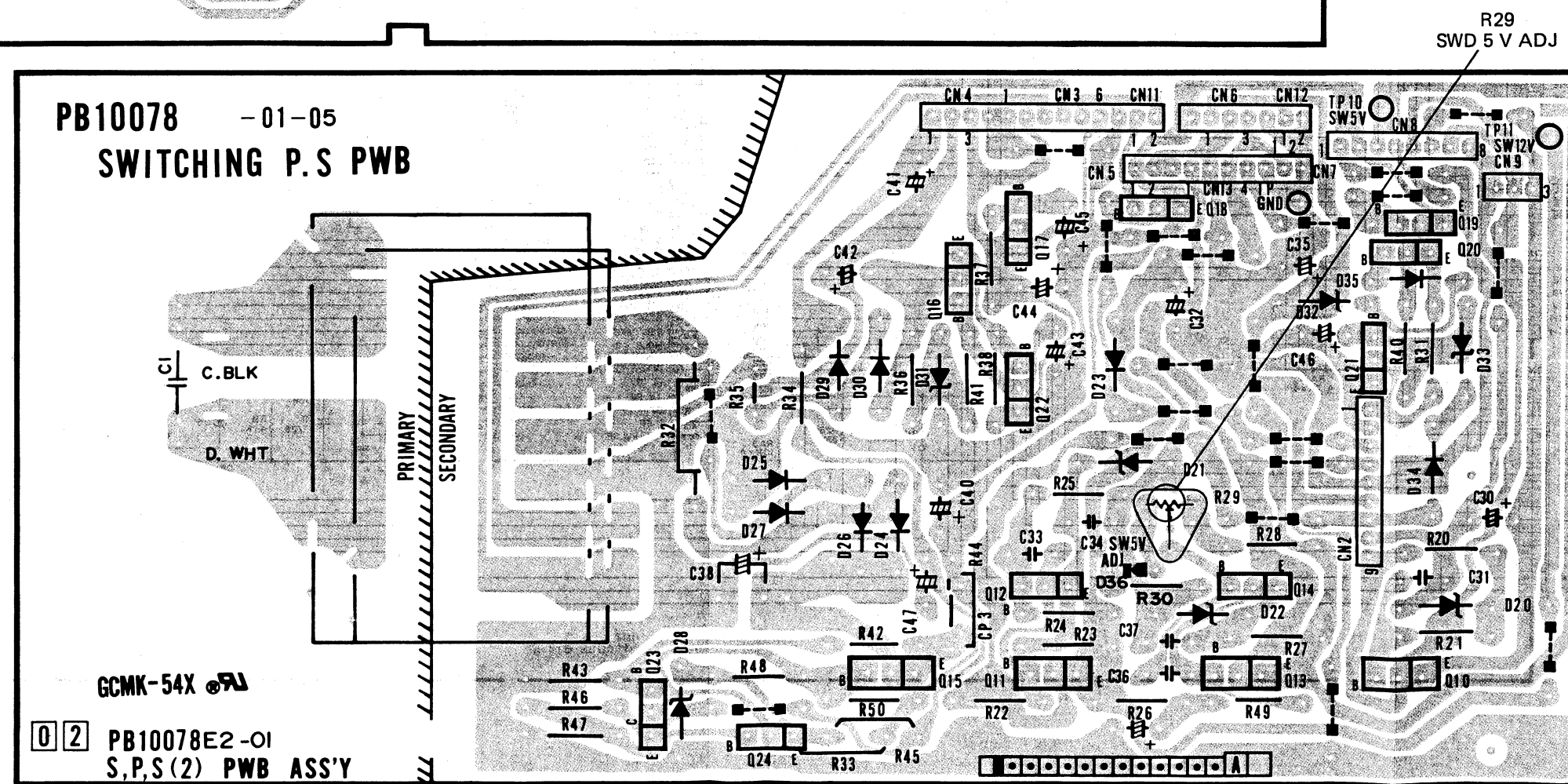


3.13 SWITCHING POWER SUPPLY (1) AND SWITCHING POWER SUPPLY (2) CIRCUIT BOARDS

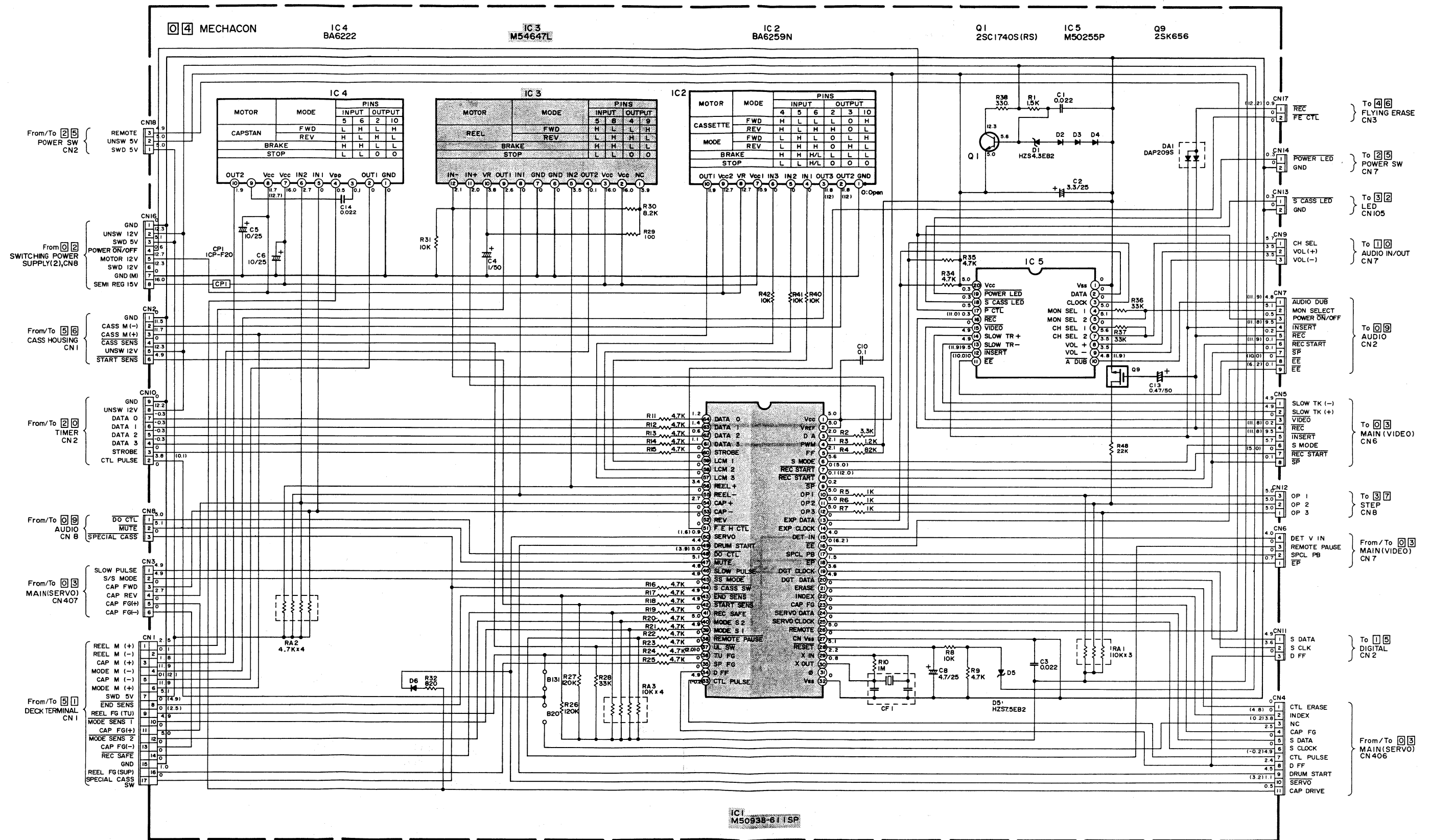
— SWITCHING POWER
SUPPLY (1) —



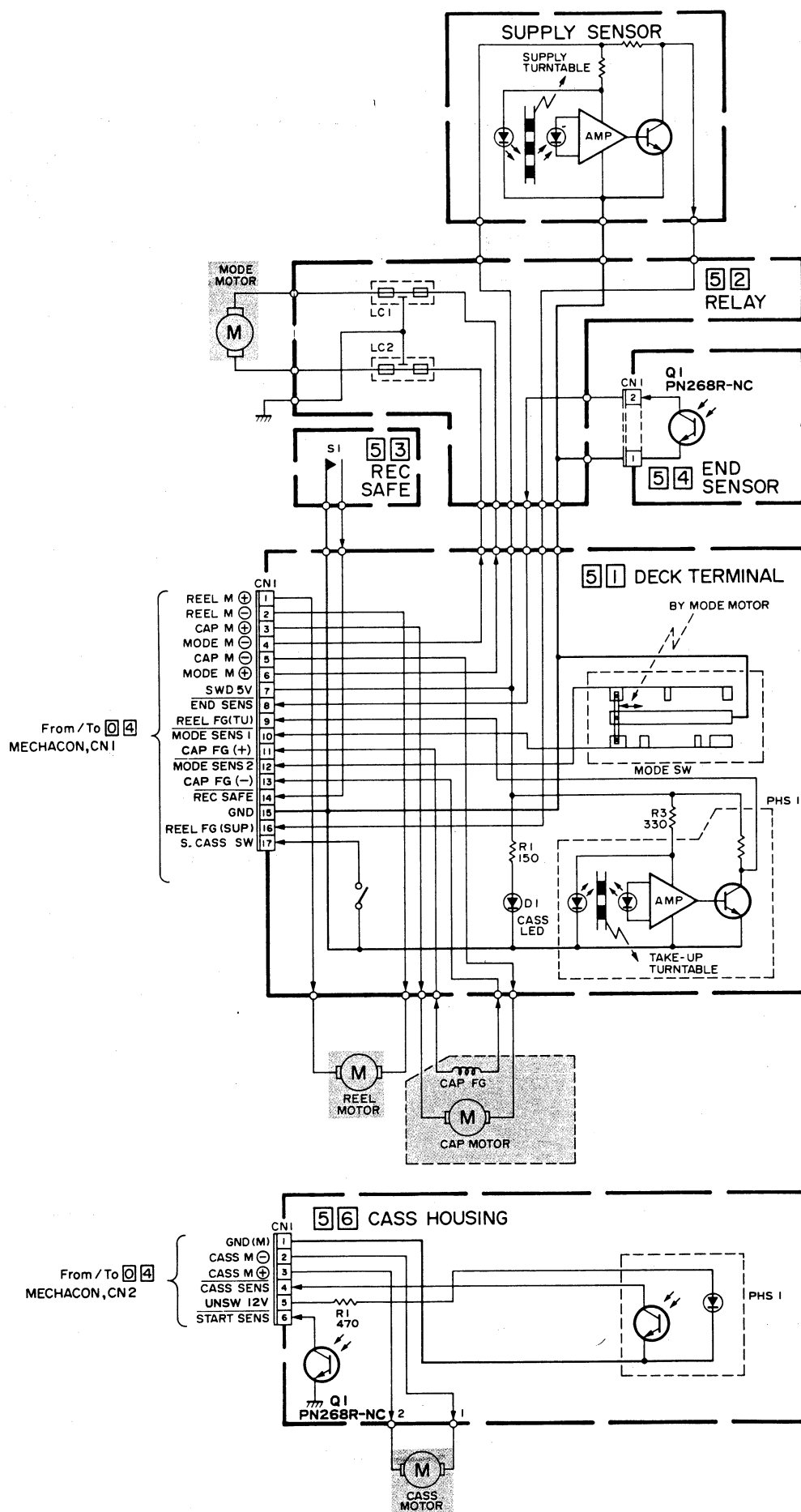
— SWITCHING POWER
SUPPLY (2) —



3.14 MECHANISM CONTROL SCHEMATIC DIAGRAM

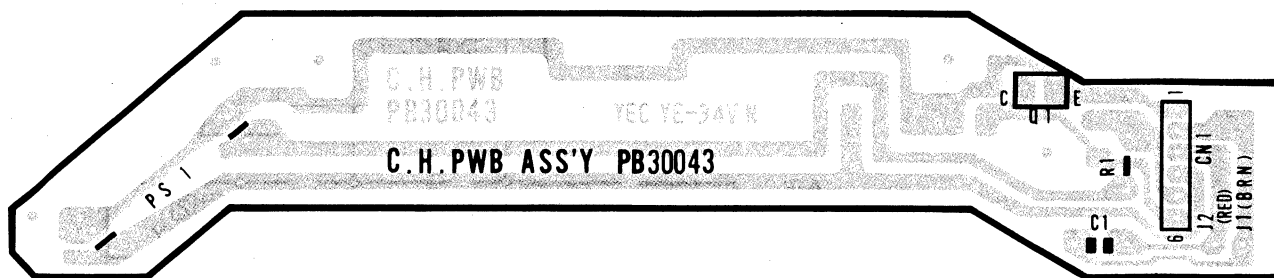


3.15 DECK TERMINAL SCHEMATIC DIAGRAMS

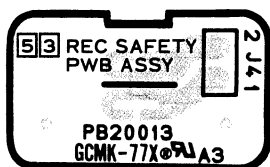


3.16 MECHANISM CONTROL AND DECK TERMINAL CIRCUIT BOARDS

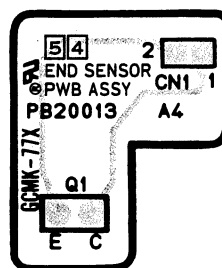
— CASSETTE HOUSING —



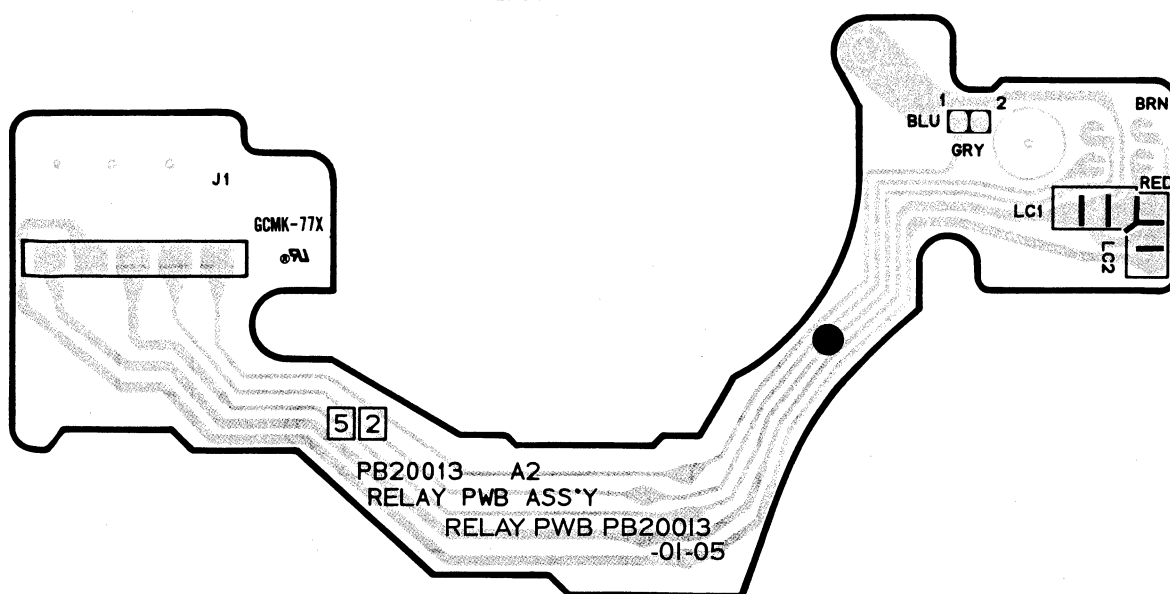
— REC SAFETY —

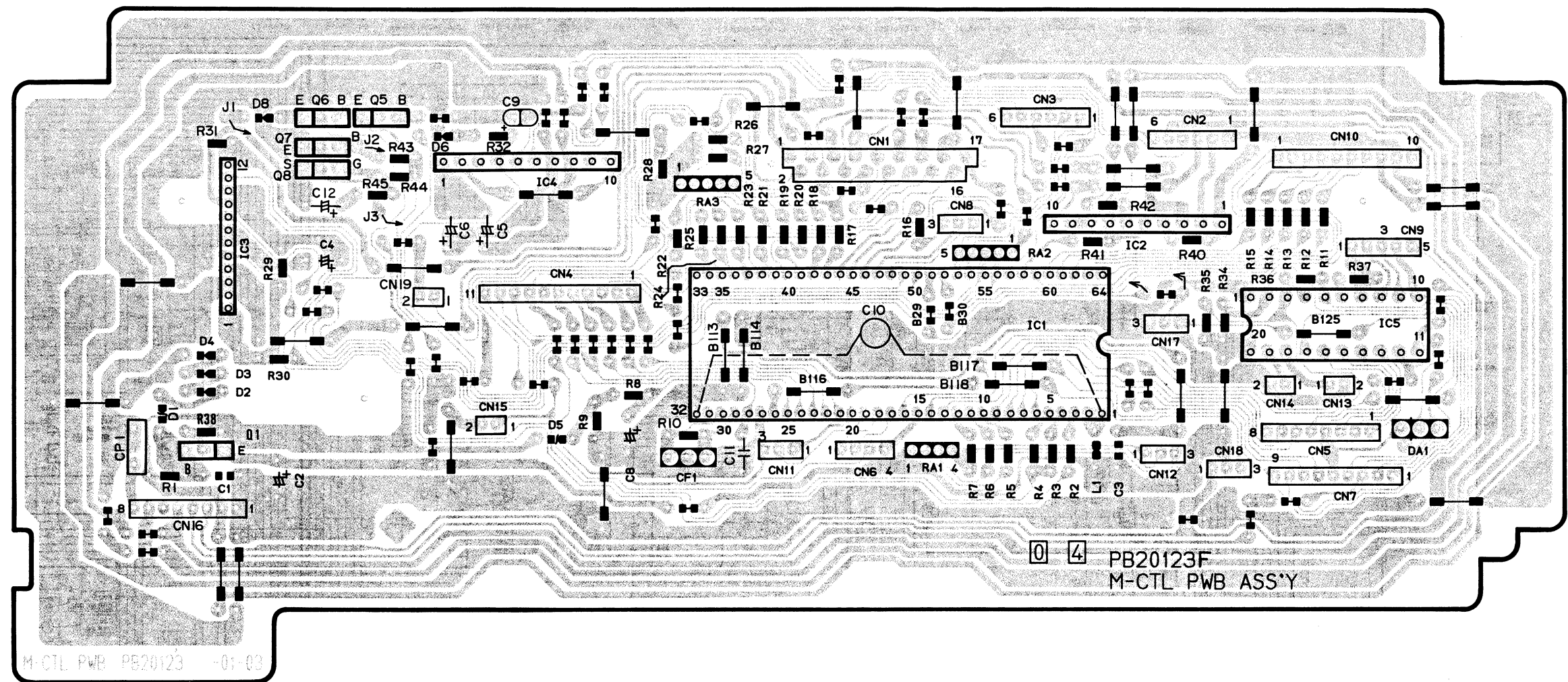


— END SENSOR —

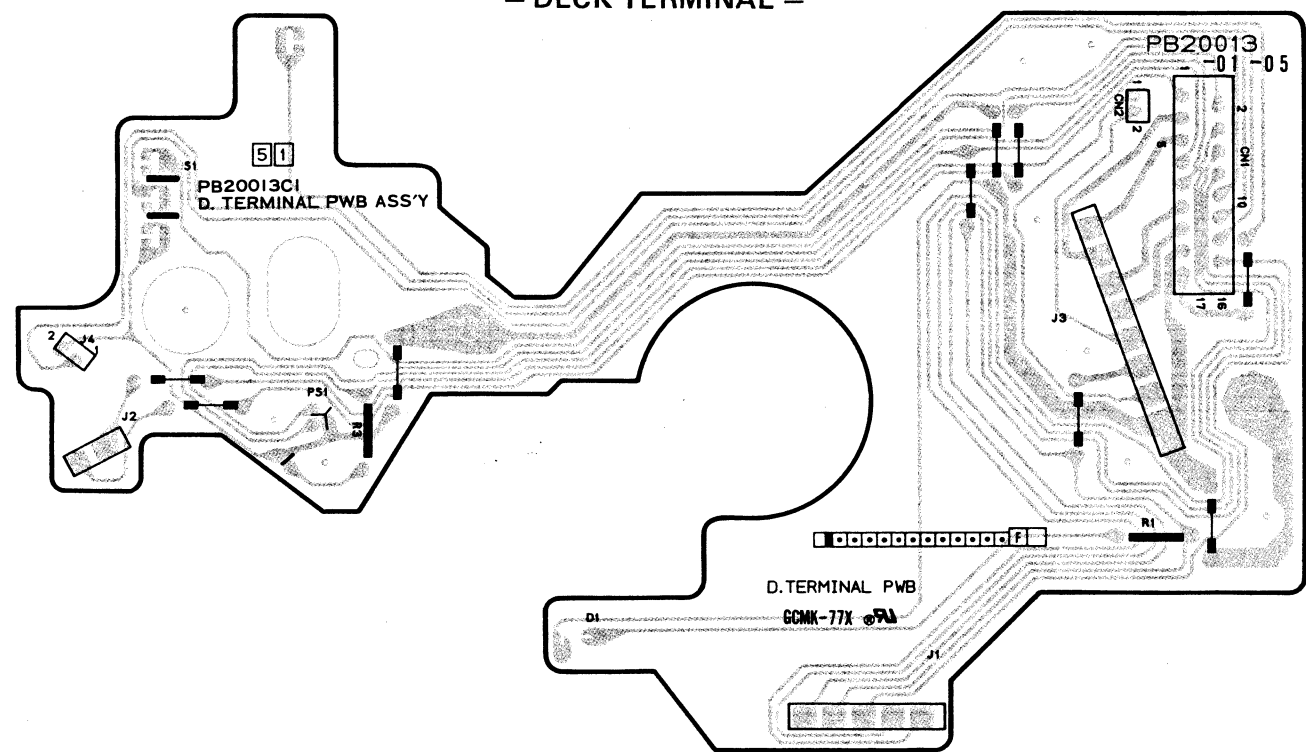


— RELAY —

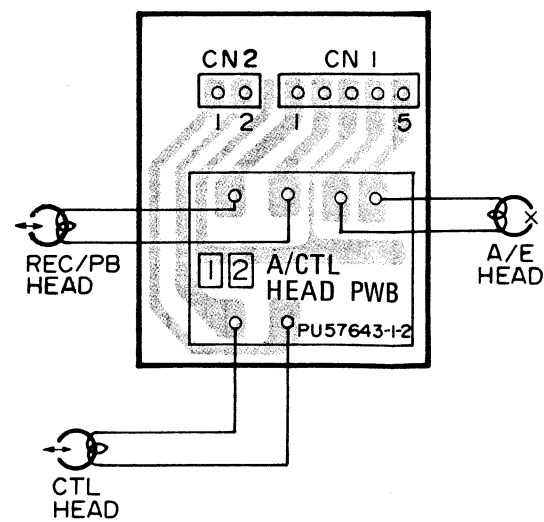


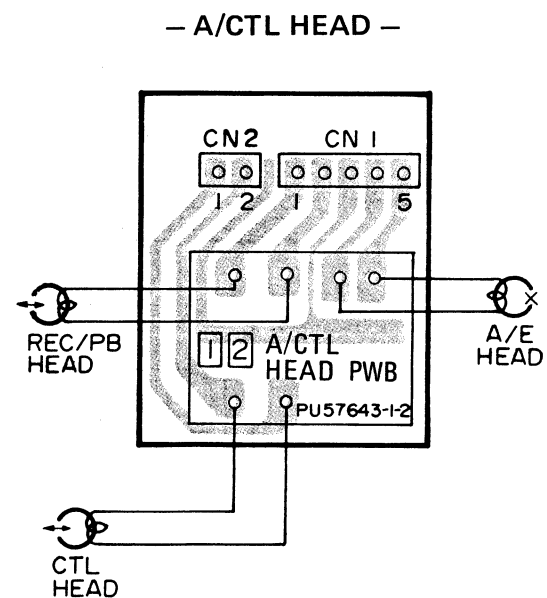
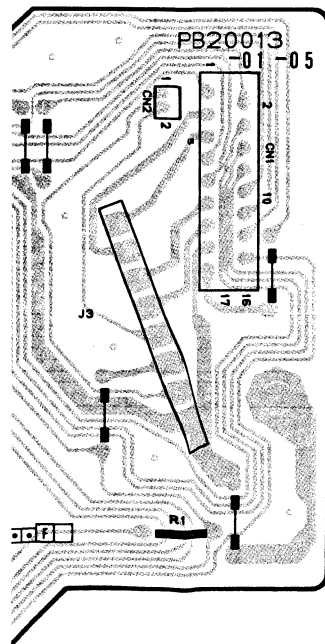
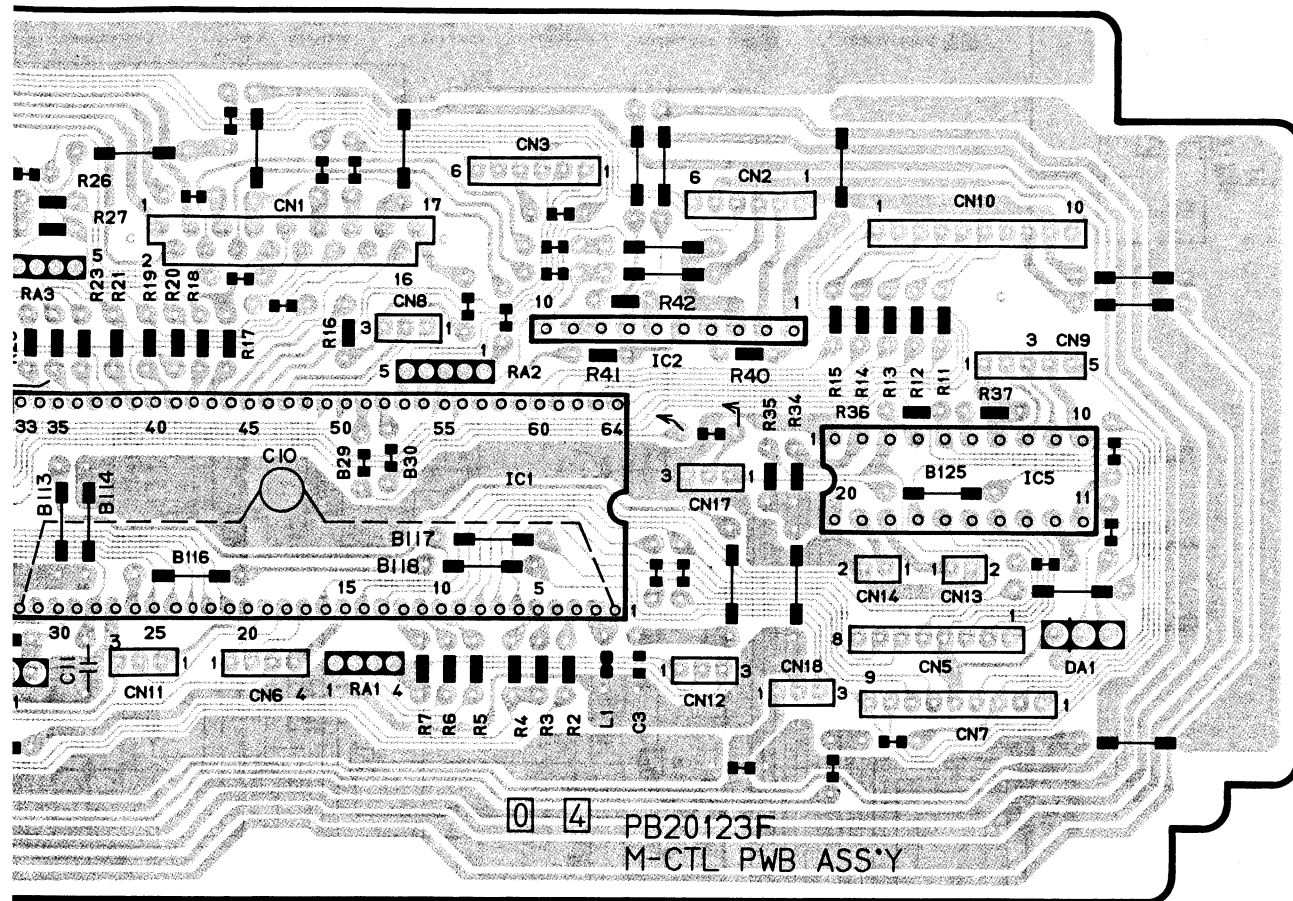


- DECK TERMINAL -



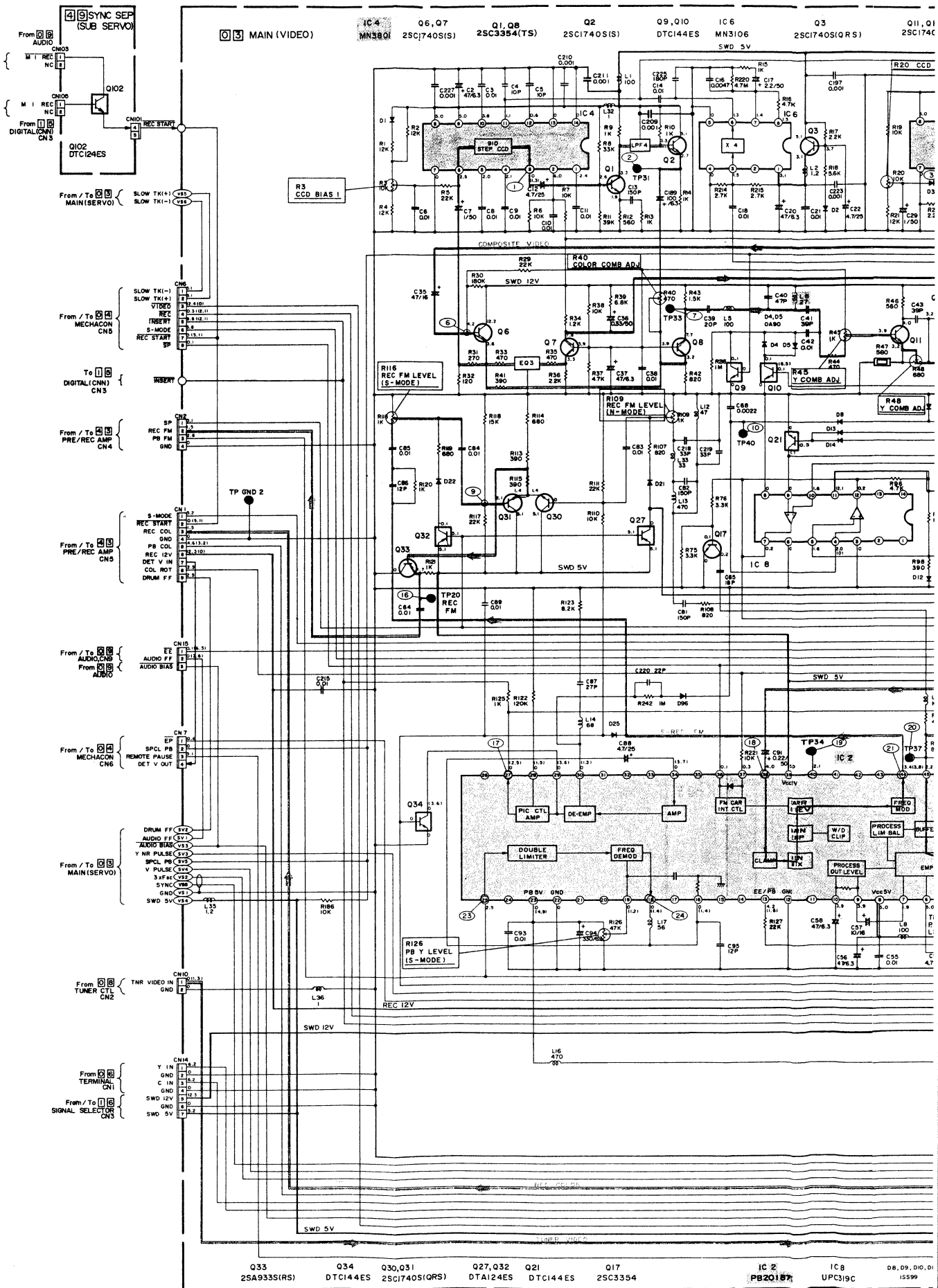
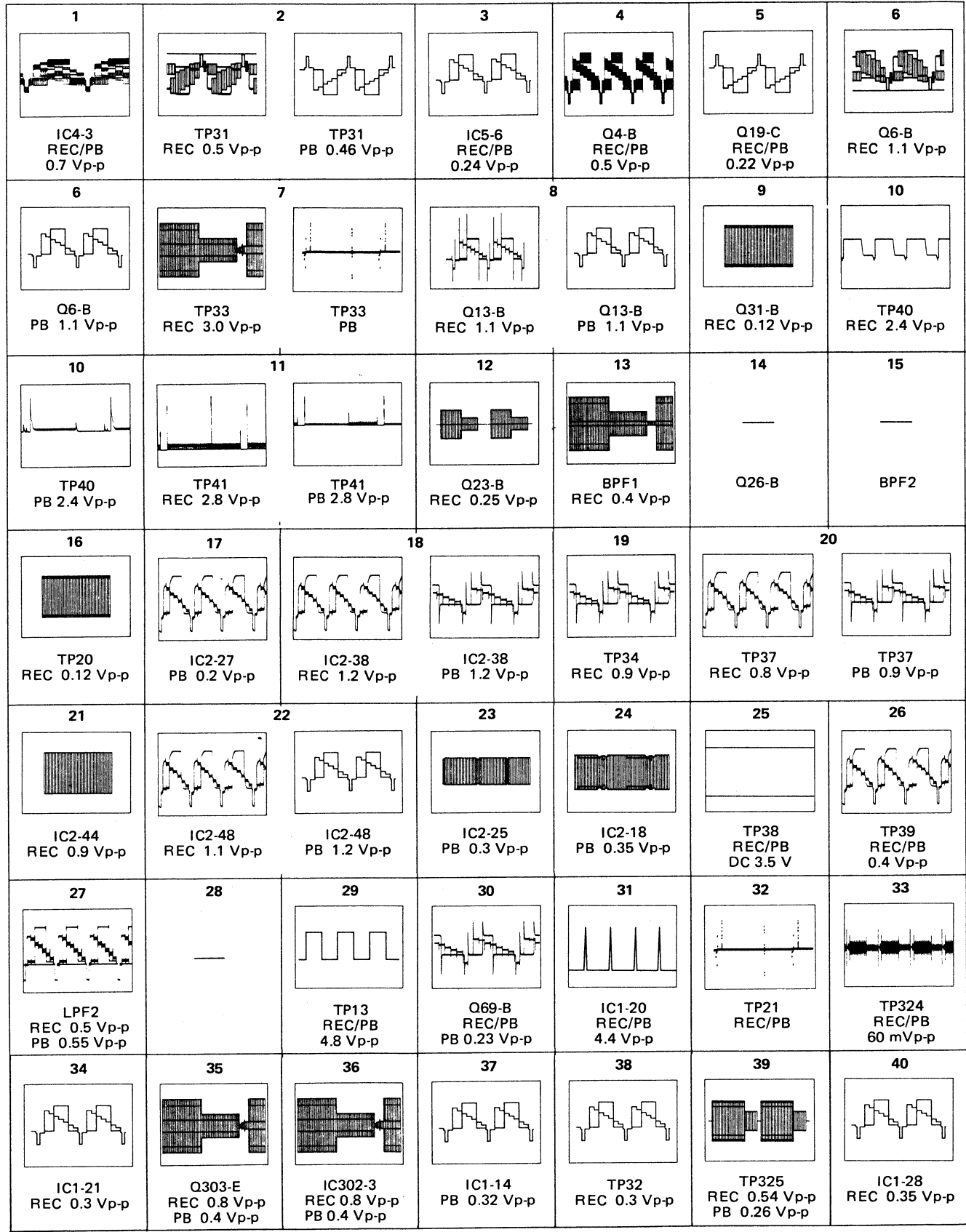
- A/CTL HEAD -



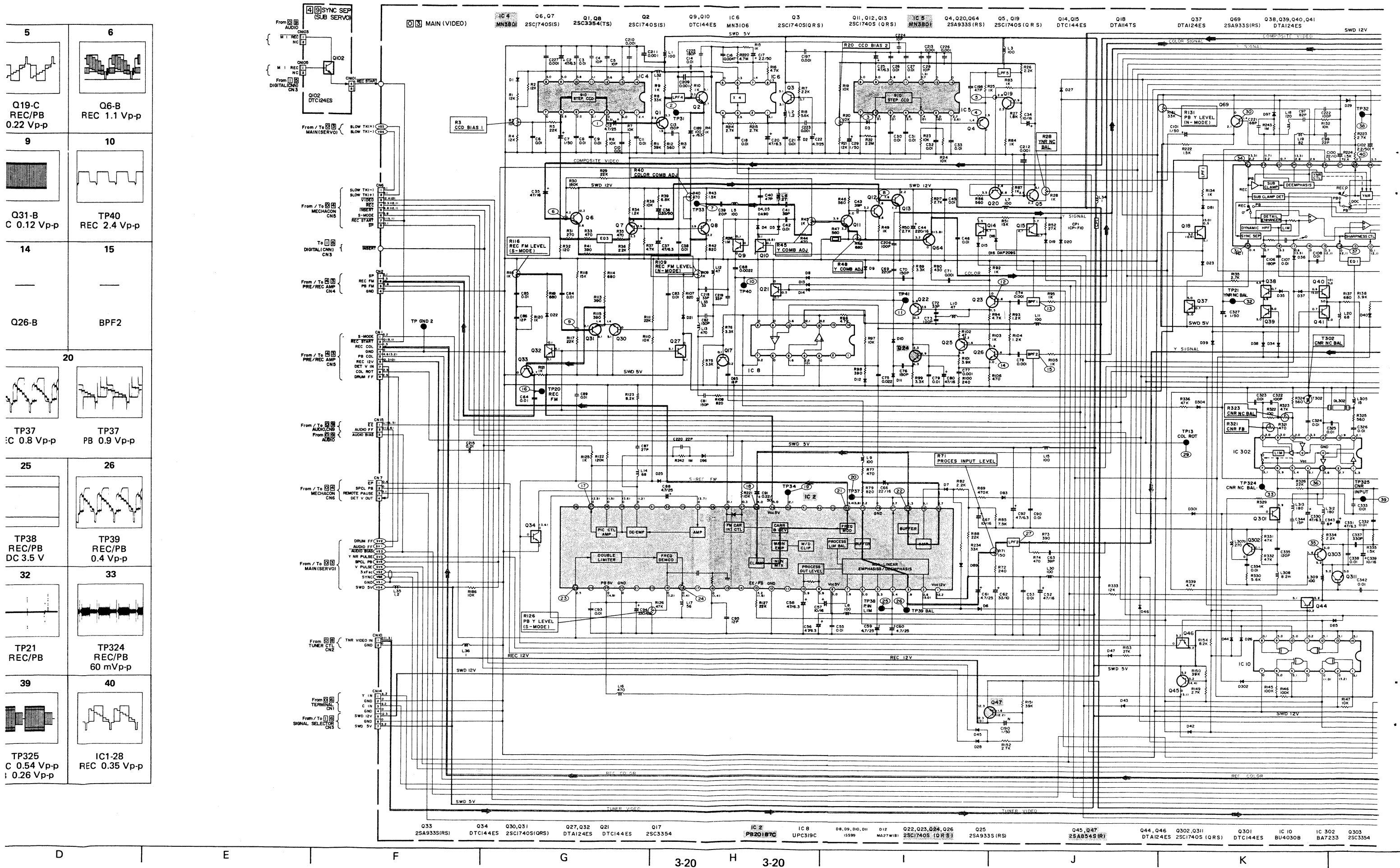


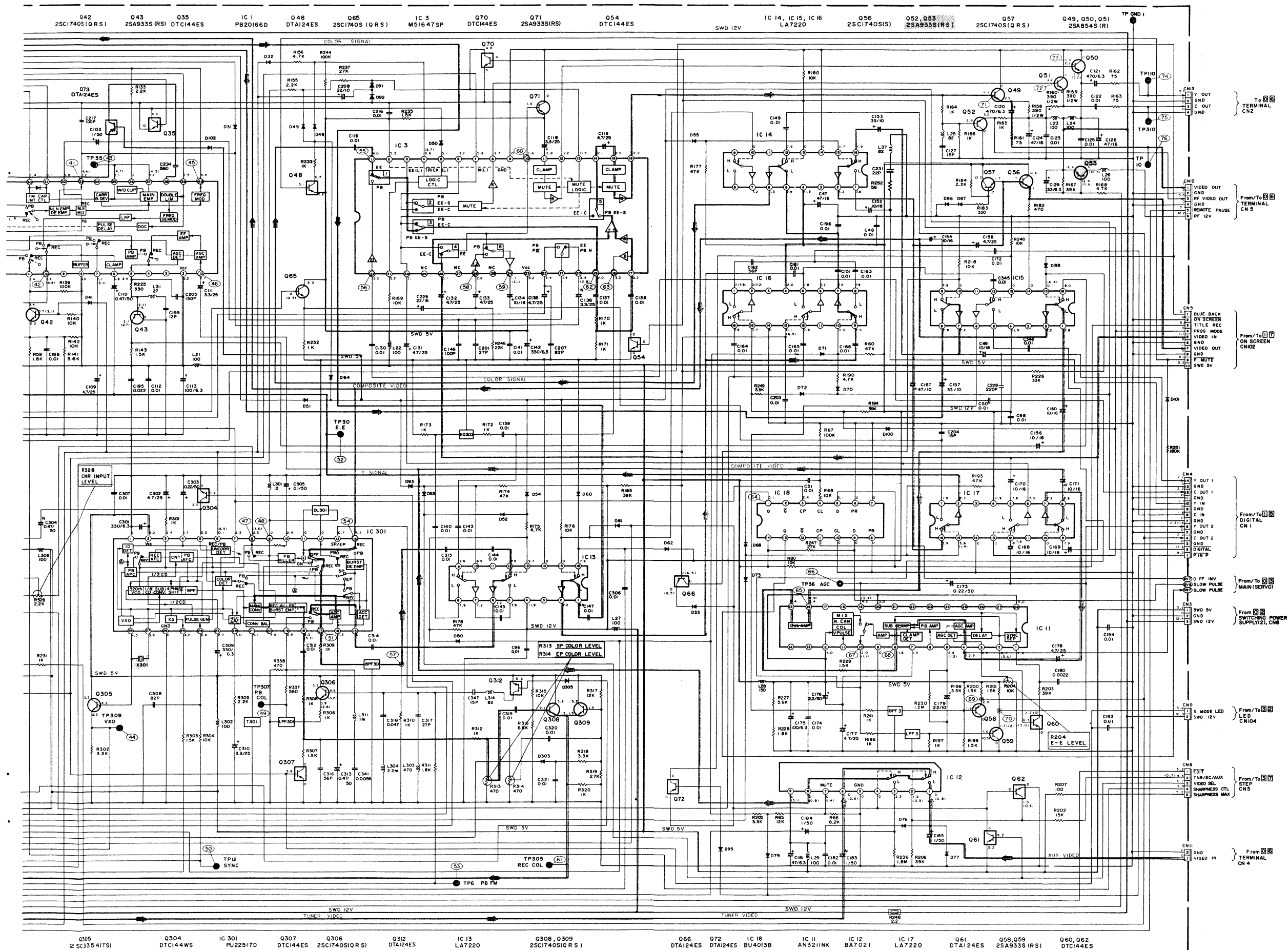
3.17 VIDEO (REC) SCHEMATIC DIAGRAM

— Waveforms of VIDEO circuit —



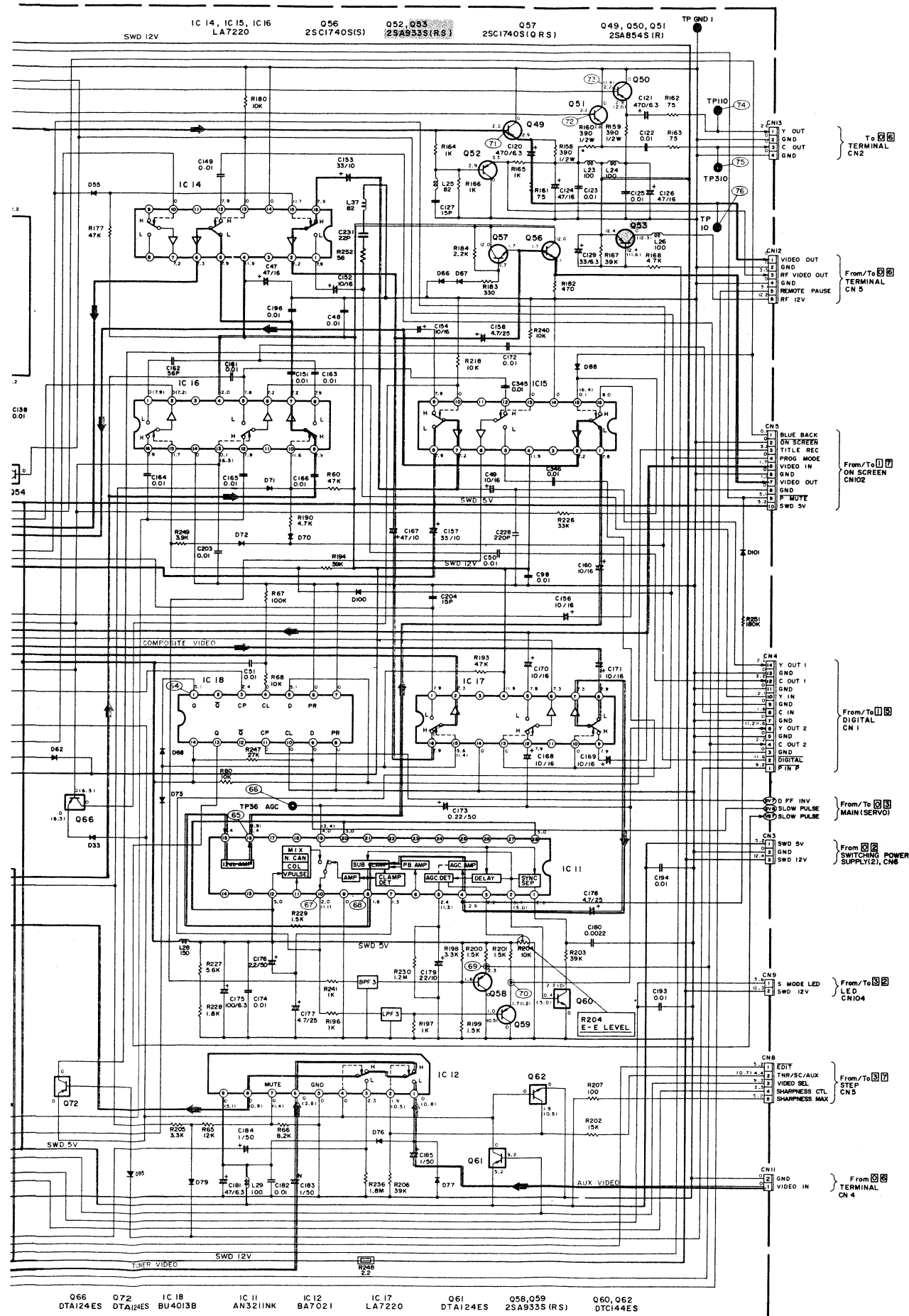
3.17 VIDEO (REC) SCHEMATIC DIAGRAM





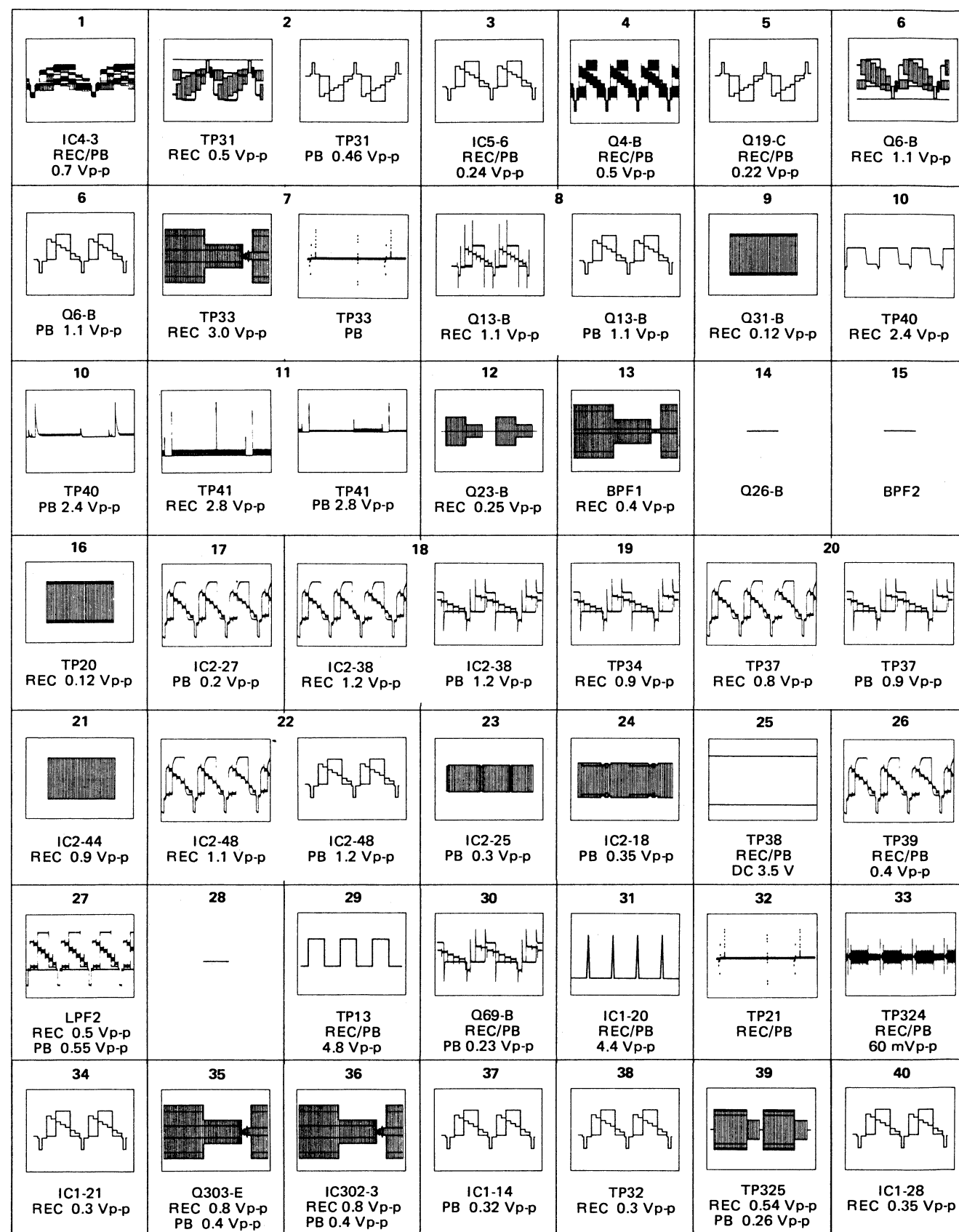
41	42
IC1-33 REC 1.2 Vp-p	IC1-10 REC 0.6 V
48	49
IC301-9 REC 0.1 Vp-p PB 0.3 Vp-p	TP307 PB 50 mV
53	59
TP6 PB 0.8 Vp-p	IC301-1 REC 1.2 V
58	59
IC3-26 PB 0.2 Vp-p	IC3-24 REC/PB 1.0 Vp-p
65	69
IC11-15 REC 1.1 Vp-p	IC11-16 PB 20 mV
75	76
Q58-E REC 0.58 Vp-p	Q58-E PB 18 mV
TP311 REC/PB 0.6 Vp-p	TP10 REC/PB 0.98 Vp

— Waveforms of VIDEO circuit —

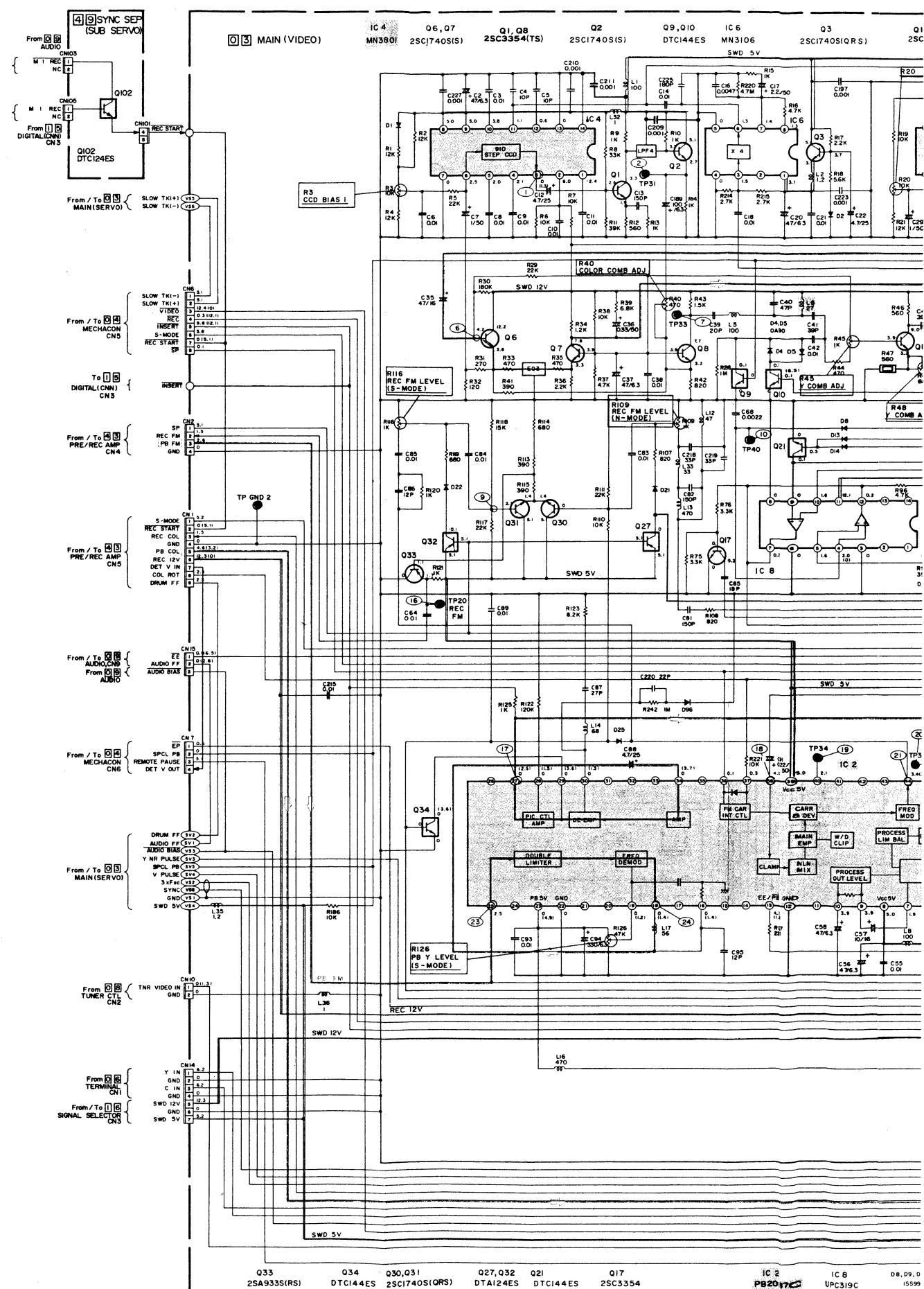


41 IC1-33 REC 1.2 Vp-p	42 IC1-10 REC 0.6 Vp-p	43 TP35 REC 0.6 Vp-p	44 TP309 REC/PB 0.5 Vp-p	45 IC1-40 DC 4.5 V	46 IC1-1 REC 1.0 Vp-p	47 IC301-8 REC 0.6 Vp-p PB 0.3 Vp-p
48 IC301-9 REC 0.1 Vp-p PB 0.3 Vp-p	49 TP307 PB 50 mVp-p	50 TP12 REC/PB 4.8 Vp-p	51 IC301-17 REC 0.65 Vp-p	52 IC301-17 PB 0.5 Vp-p	53 TP30 REC 1.0 Vp-p	54 TP30 PB 1.0 Vp-p
55 TP6 PB 0.8 Vp-p	56 IC301-14 REC 1.2 Vp-p	57 IC301-14 PB 1.1 Vp-p	58 IC3-1 REC 0.62 Vp-p	59 IC3-32 REC 0.72 Vp-p	60 IC3-32 PB 0.4 Vp-p	61 BPF301
62 TP36 PB 0.2 Vp-p	63 IC3-24 REC/PB 1.0 Vp-p	64 IC3-10 REC/PB 1.0 Vp-p	65 TP305 REC 20 mVp-p	66 IC3-19 REC 0.6 Vp-p PB 0.5 Vp-p	67 IC3-18 REC/PB 0.58 Vp-p	68 IC18-1 REC/PB 35 mVp-p
69 IC11-16 REC 1.1 Vp-p	70 IC11-16 PB 20 mVp-p	71 TP36 REC 1.1 Vp-p	72 IC11-10 REC 2.2 Vp-p	73 IC11-10 PB 50 mVp-p	74 IC11-8 REC 0.7 Vp-p	75 IC11-8 PB 18 mVp-p
76 Q58-E REC 0.58 Vp-p	77 Q58-E PB 18 mVp-p	78 Q59-E REC 1.1 Vp-p	79 Q49-B REC 1.8 Vp-p PB 2.0 Vp-p	80 Q51-B REC/PB 1.24 Vp-p	81 Q50-B REC/PB 1.8 Vp-p	82 TP110 REC/PB 0.98 Vp-p
83 TP310 REC/PB 0.6 Vp-p	84 TP10 REC/PB 0.98 Vp-p					

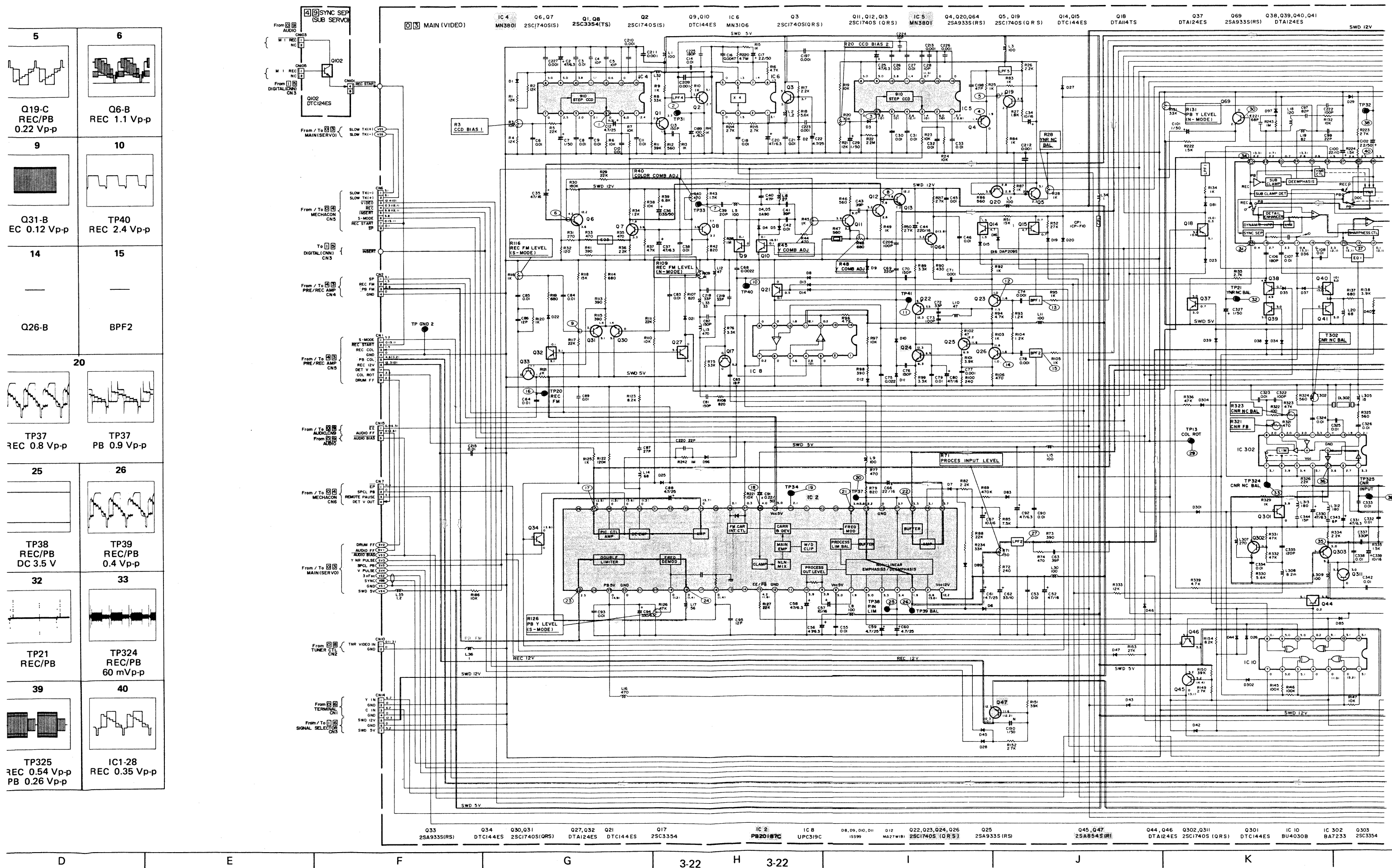
- Waveforms of VIDEO circuit -

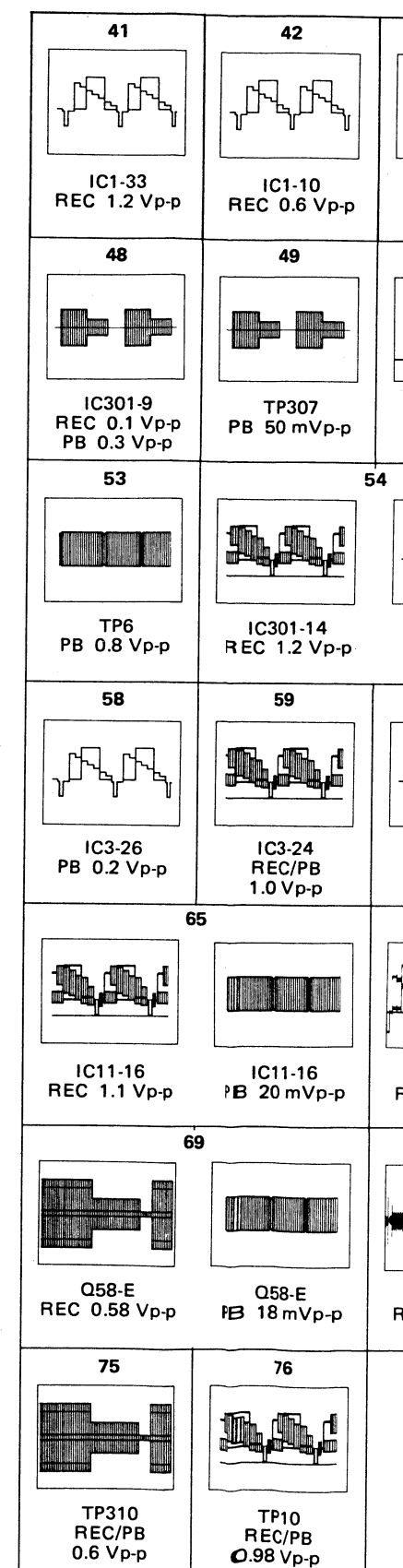


3.18 VIDEO (PB) SCHEMATIC DIAGRAM

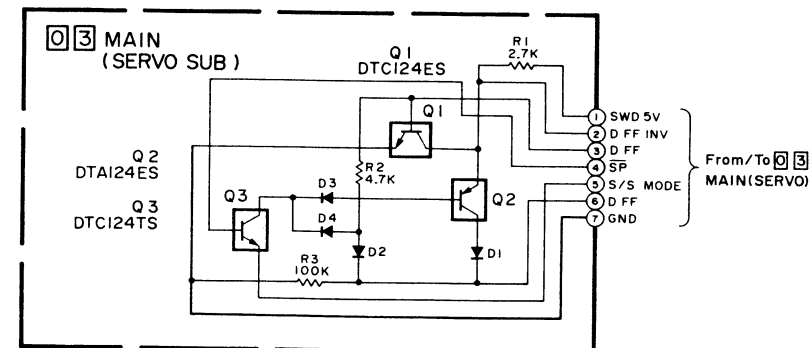


3.18 VIDEO (PB) SCHEMATIC DIAGRAM

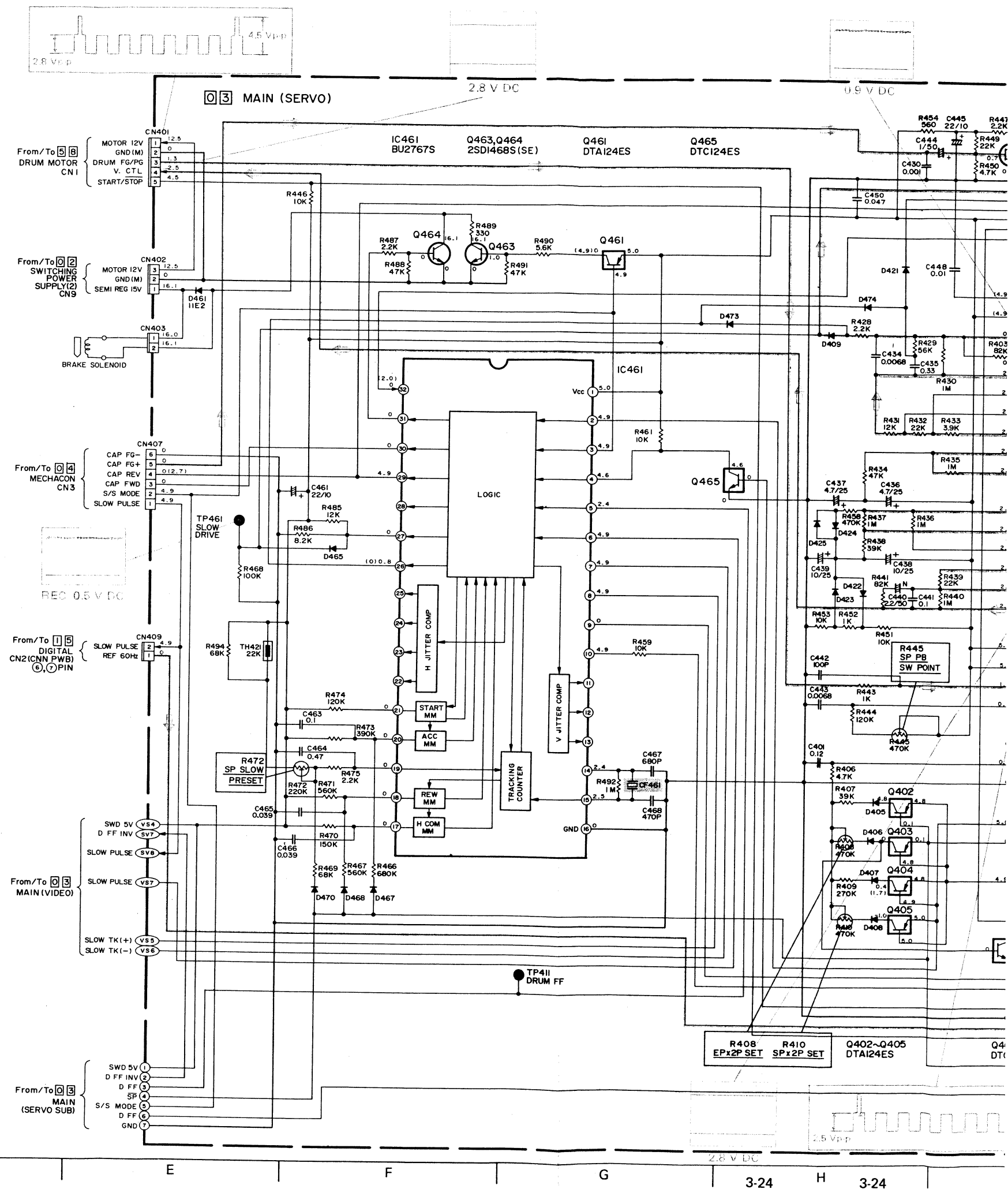
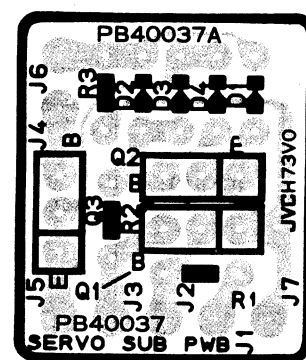


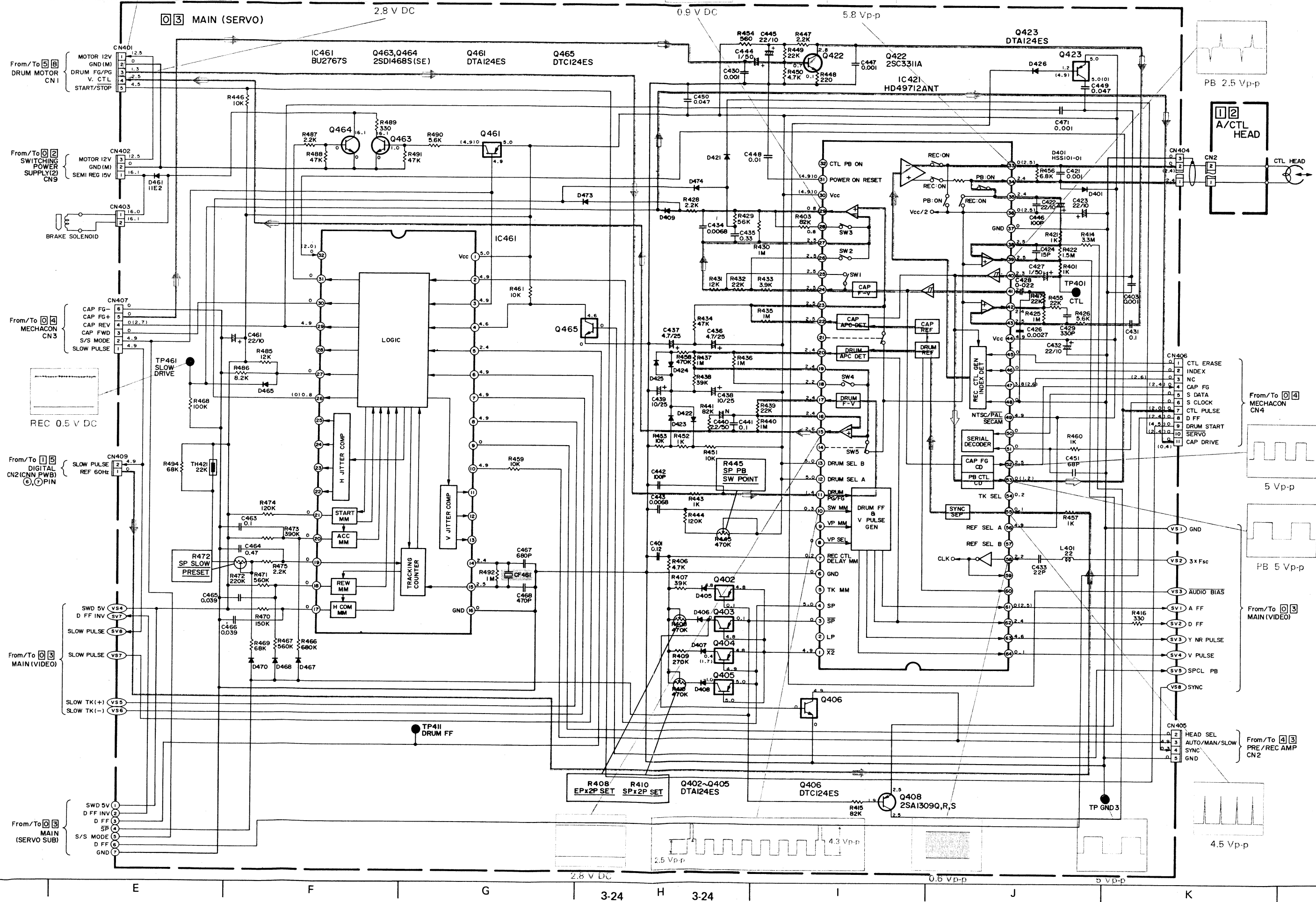


3.19 SERVO, SERVO SUB SCHEMATIC DIAGRAMS AND SERVO SUB CIRCUIT BOARD



— SERVO SUB —





6
5
4
3
2
1
A B C 3-25 E F G H

3.20 MAIN (VIDEO/SERVO) CIRCUIT BOARD

— MAIN (VIDEO/SERVO) —

R116
REC FM (S-MODE)

R131
PB Y (N-MODE)

R321
C NR FB

R323, T302
C NR NC BALANCE

R313
REC COLOR LEVEL (SP MODE)

R314
REC COLOR LEVEL (EP MODE)

R109
REC FM
(N-MODE)

R71
PROCESS
INPUT LEVEL

R126
PB Y
(S-MODE)

R144
SYNC DET

R45
Y COMB ADJ

R48
Y COMB ADJ

R40
COLOR COMB ADJ

R3
CCD BIAS I

R28
Y NR NC BAL

R20
CCD BIAS 2

R328
CNR INPUT
LEVEL

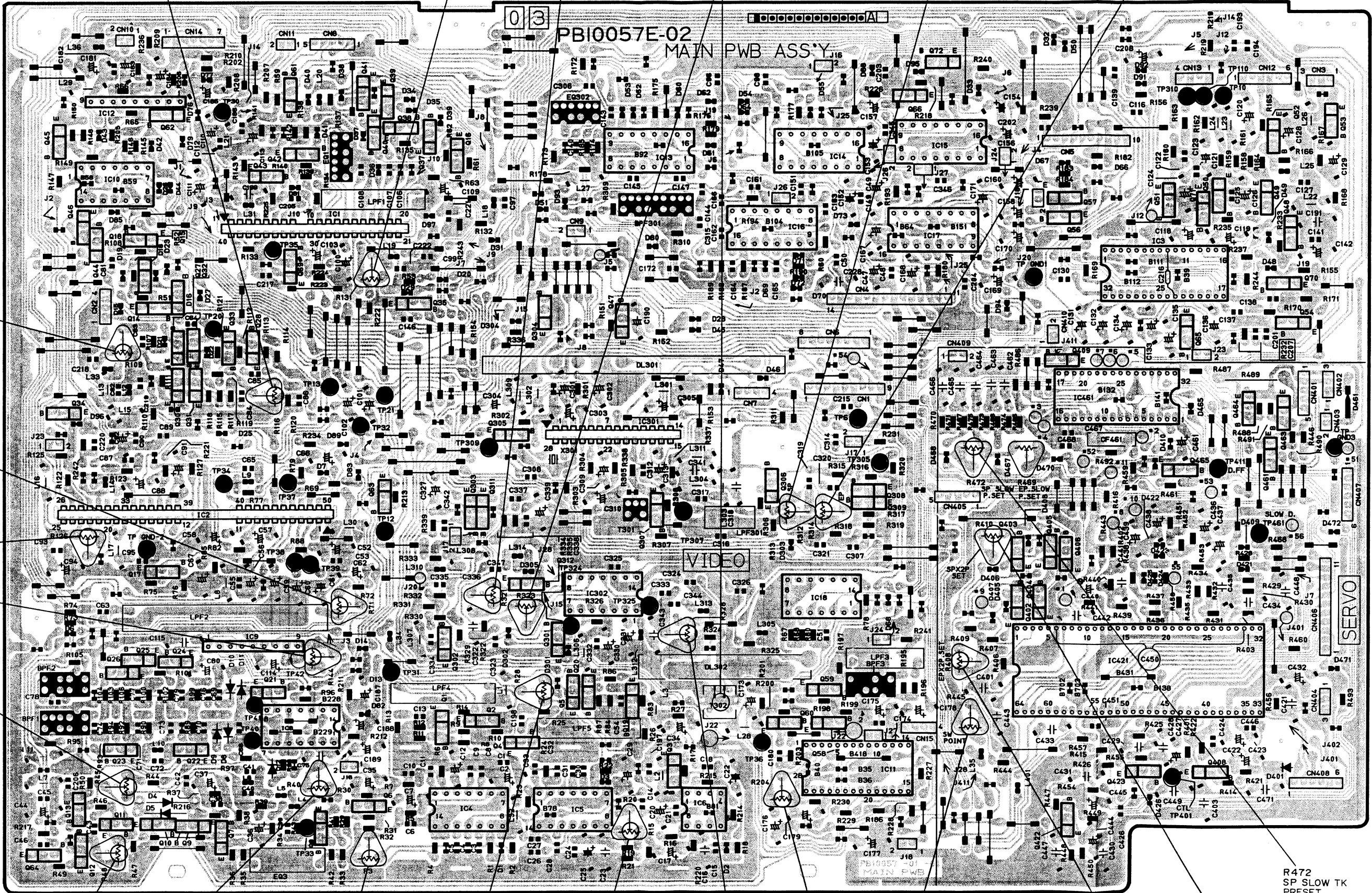
R204
E-E LEVEL

R445
SP PB SW POINT

R408
EP X 2 PRESET

R410
SP X 2 PRESET

R472
SP SLOW TK
PRESET



3.21 PRE/REC AMP SCHEMATIC DIAGRAM

6

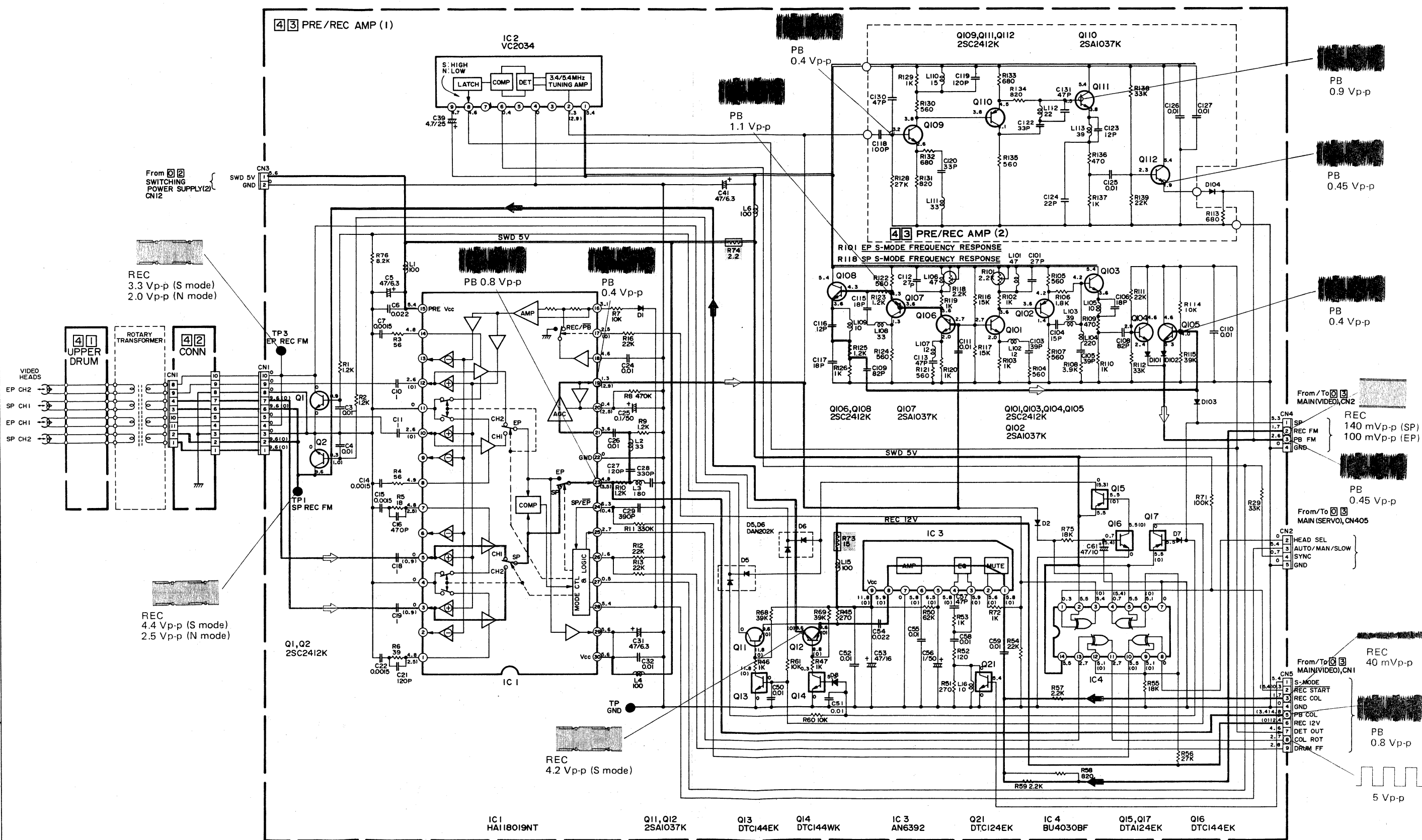
5

4

3

2

1



A

B

C

3-26 D

3-26 E

F

G

H

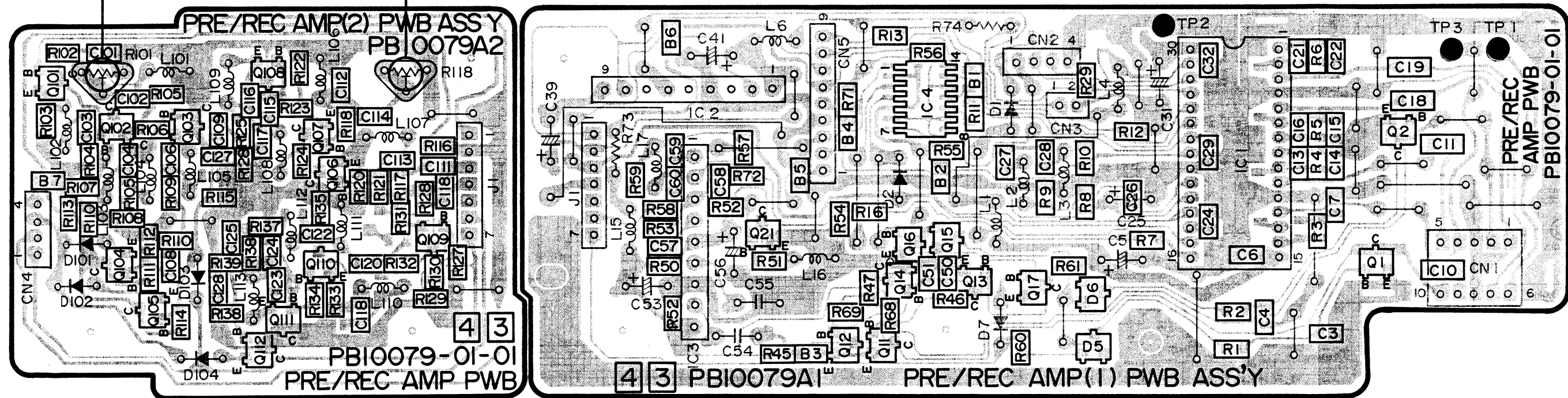
3.22 PRE/REC AMP (1) AND PRE/REC AMP (2) CIRCUIT BOARDS

— PRE/REC AMP (2) —

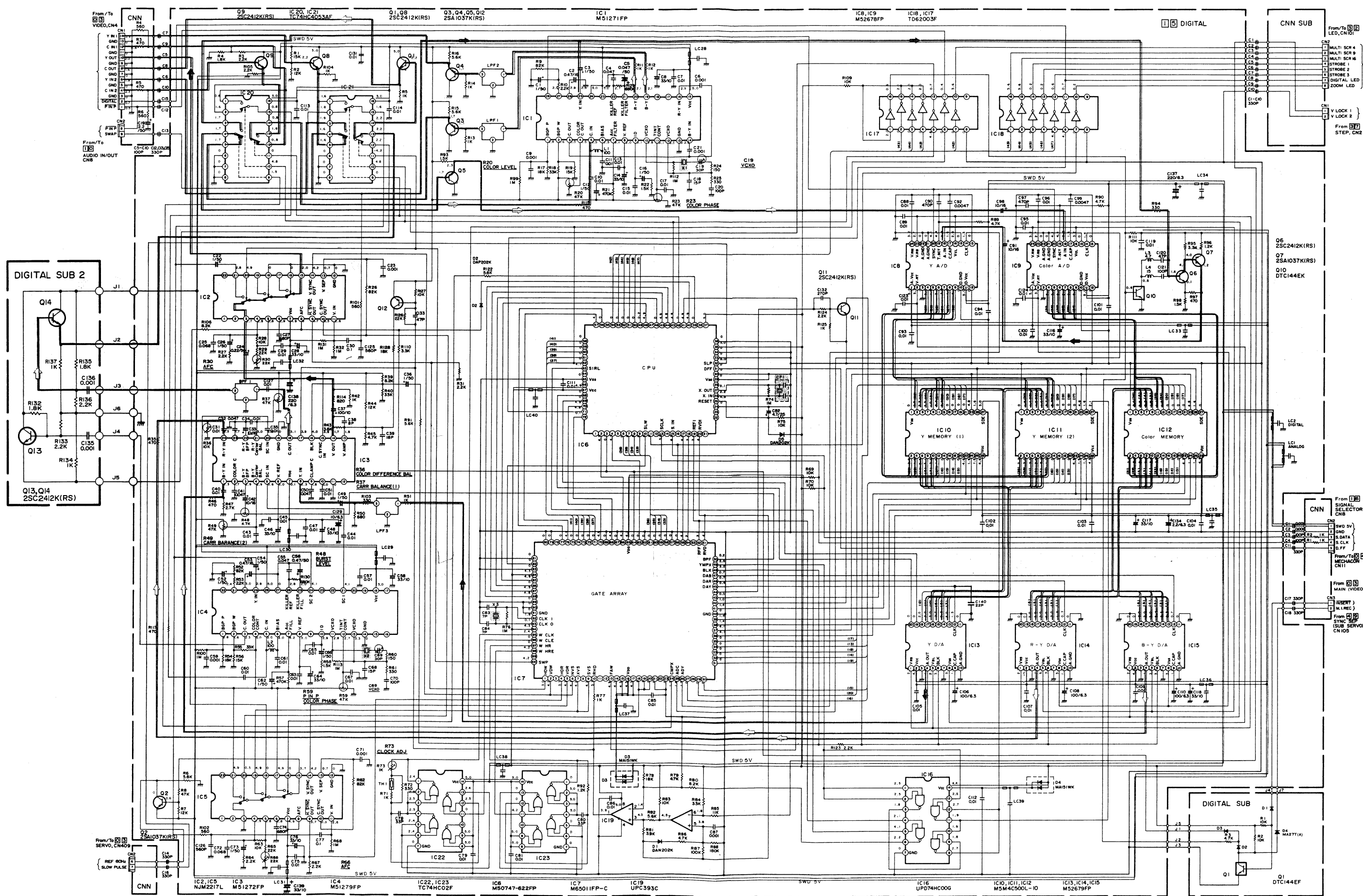
— PRE/REC AMP (1) —

R101
FREQUENCY RESPONSE
& CH BAL(EP)

RI18
FREQUENCY RESPONSE
& CH BAL(SP)

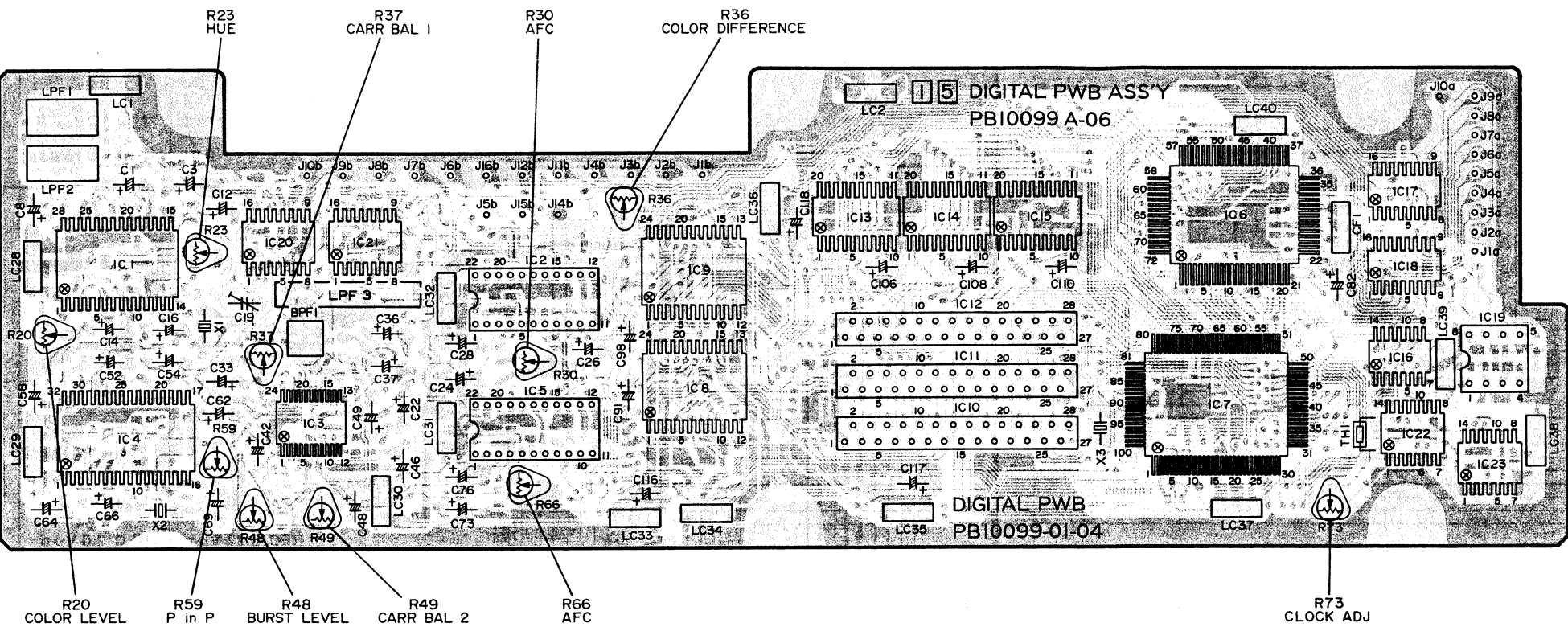


3.23 DIGITAL, DIGITAL SUB, DIGITAL SUB 2, CNN AND CNN SUB SCHEMATIC DIAGRAMS

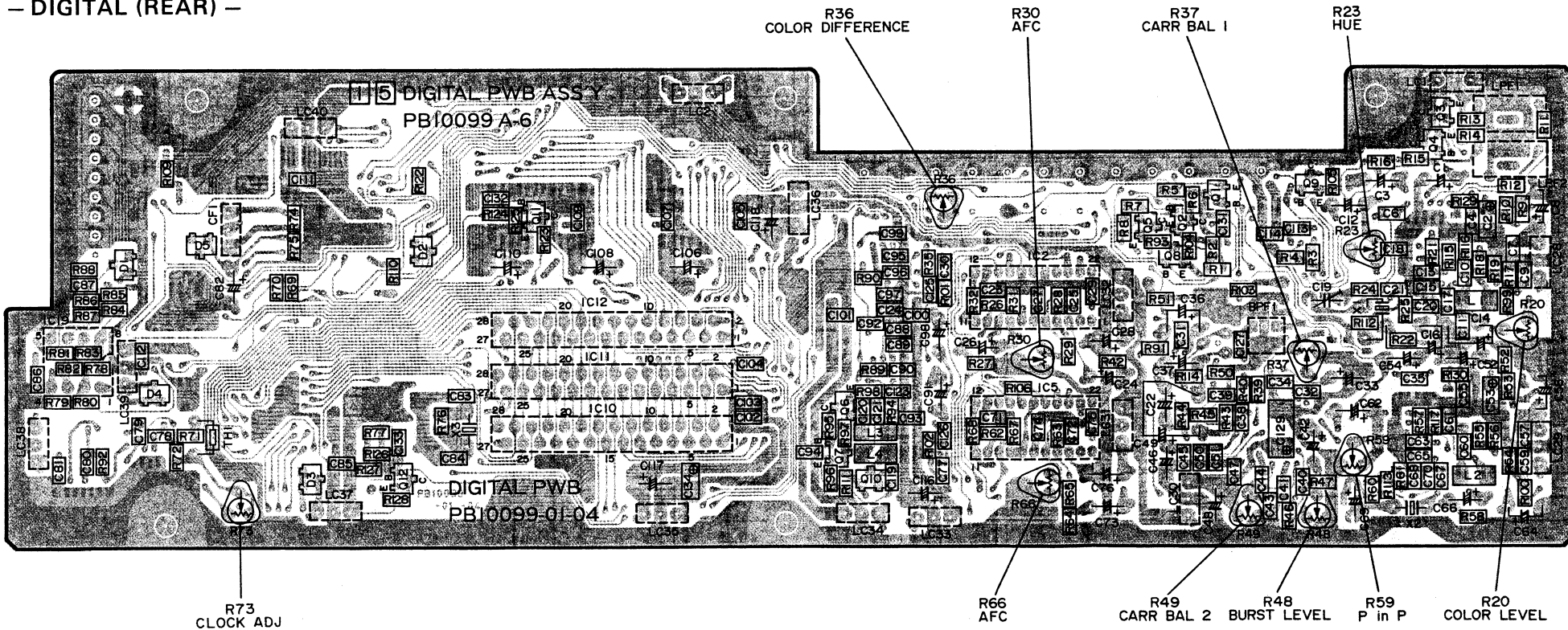


3.24 DIGITAL, DIGITAL SUB, DIGITAL SUB 2, CNN AND CNN SUB CIRCUIT BOARDS

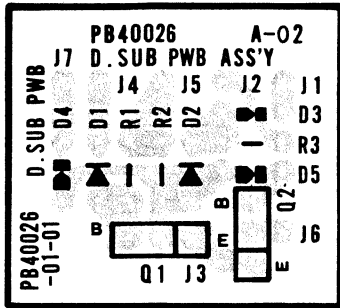
— DIGITAL (FRONT) —



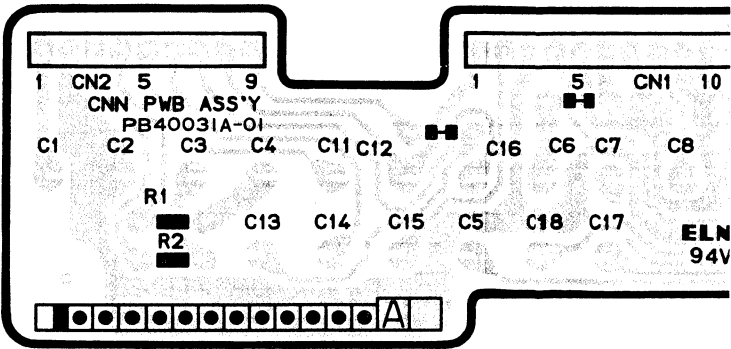
— DIGITAL (REAR) —



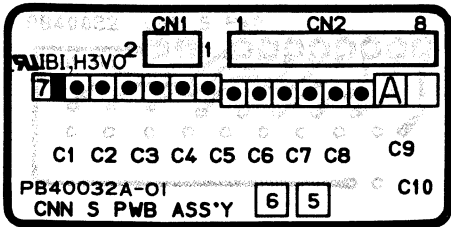
— DIGITAL SUB —

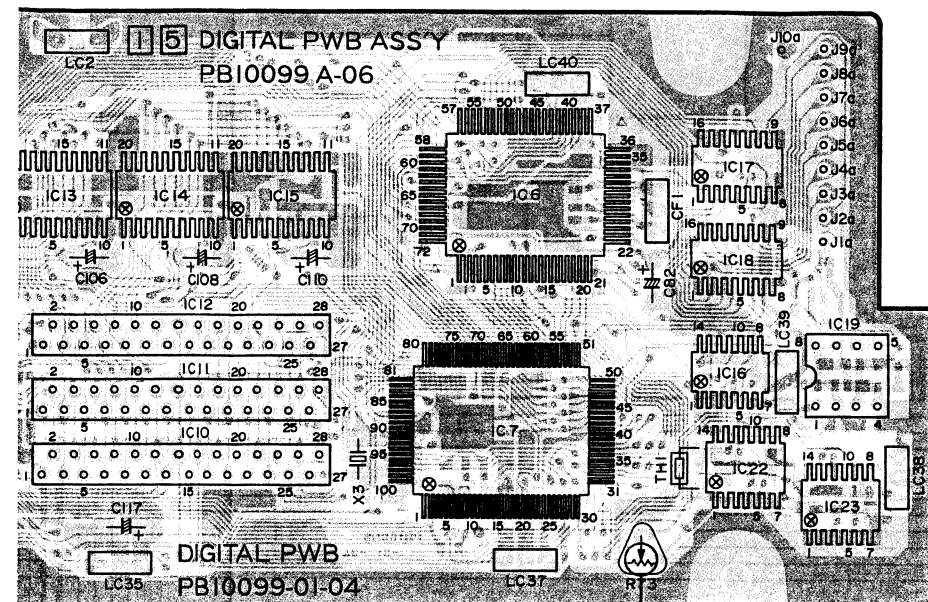


— CNN —

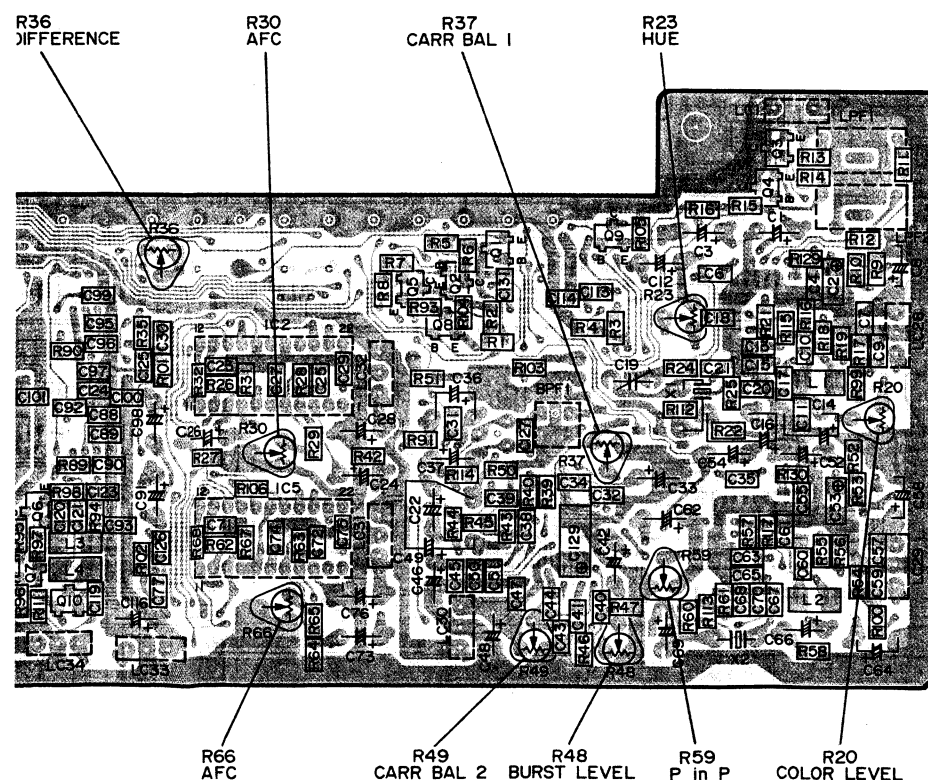


— CNN SUB —

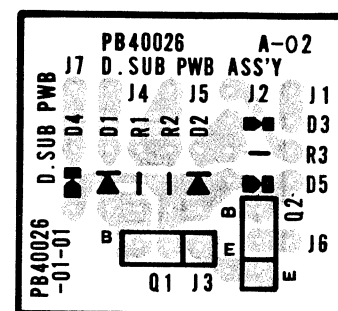




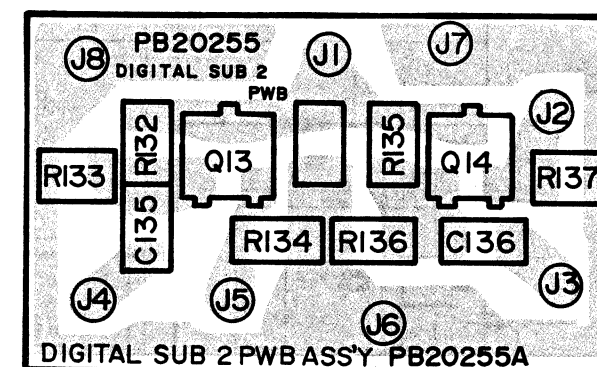
R73
CLOCK ADJ



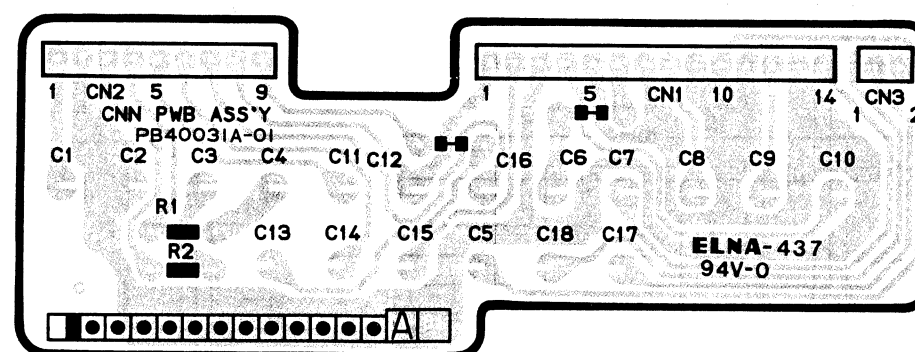
– DIGITAL SUB –



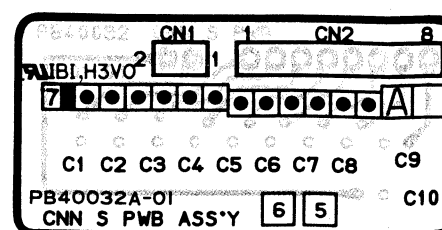
– DIGITAL SUB 2 –



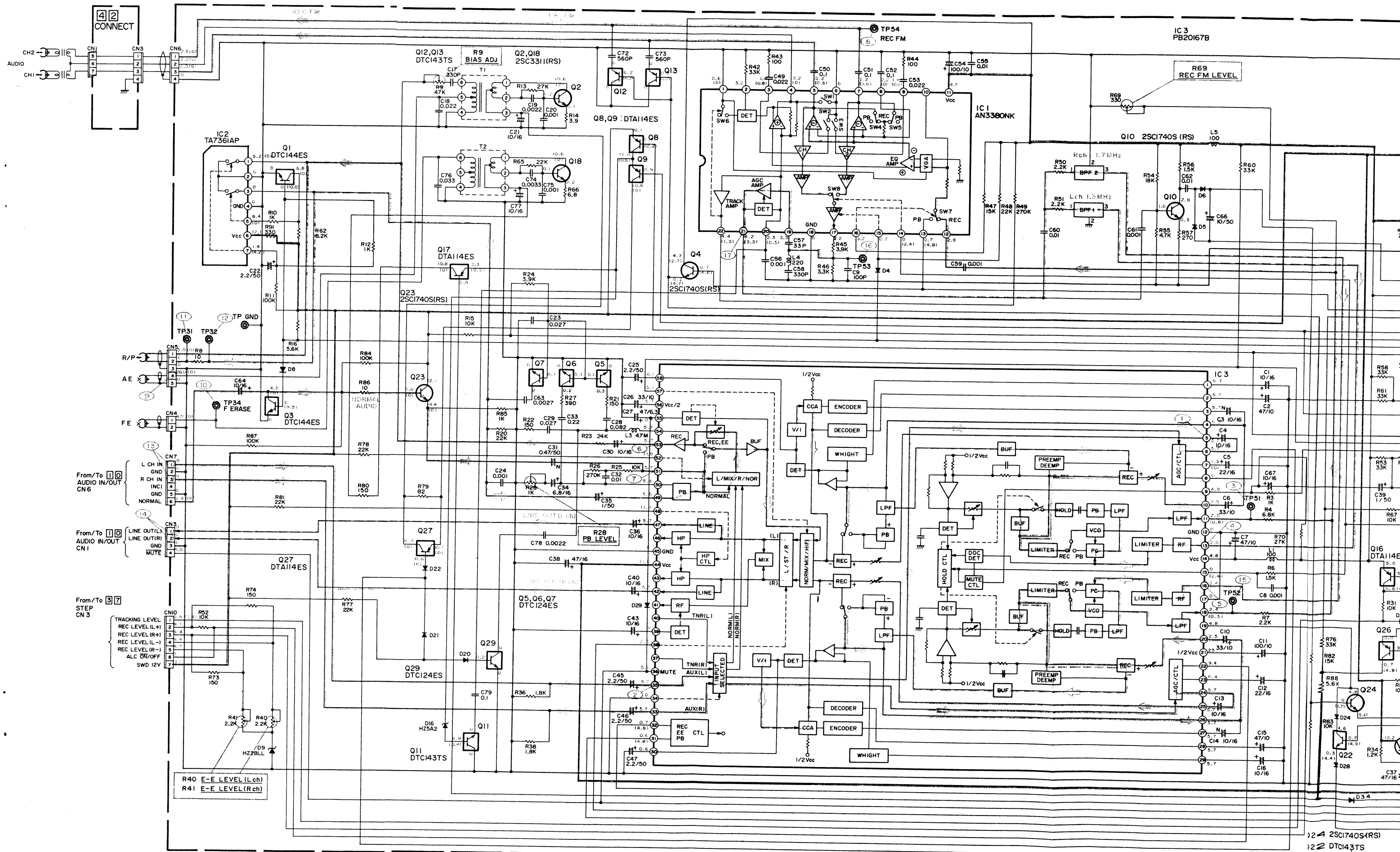
— CNN —



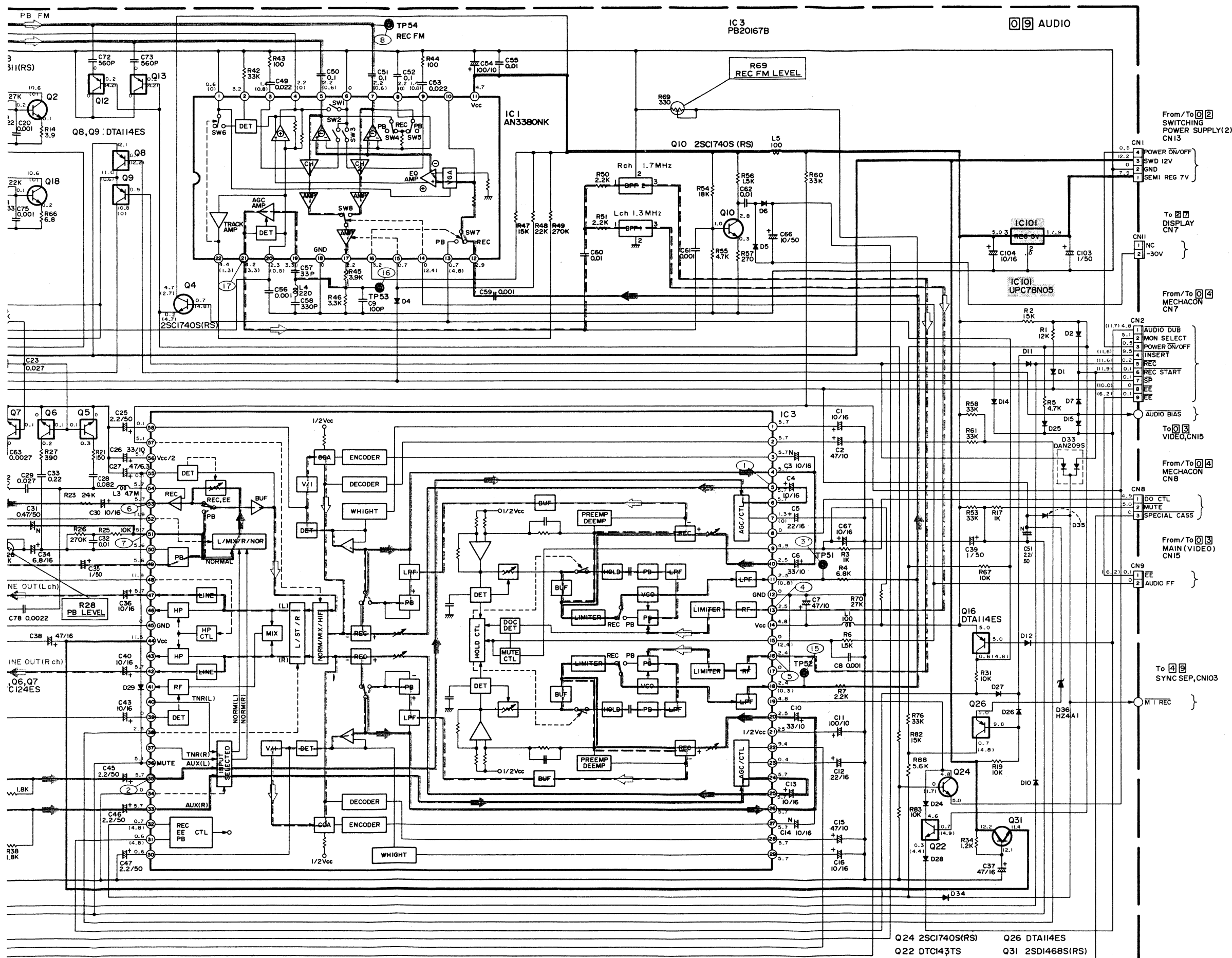
— CNN SUB —



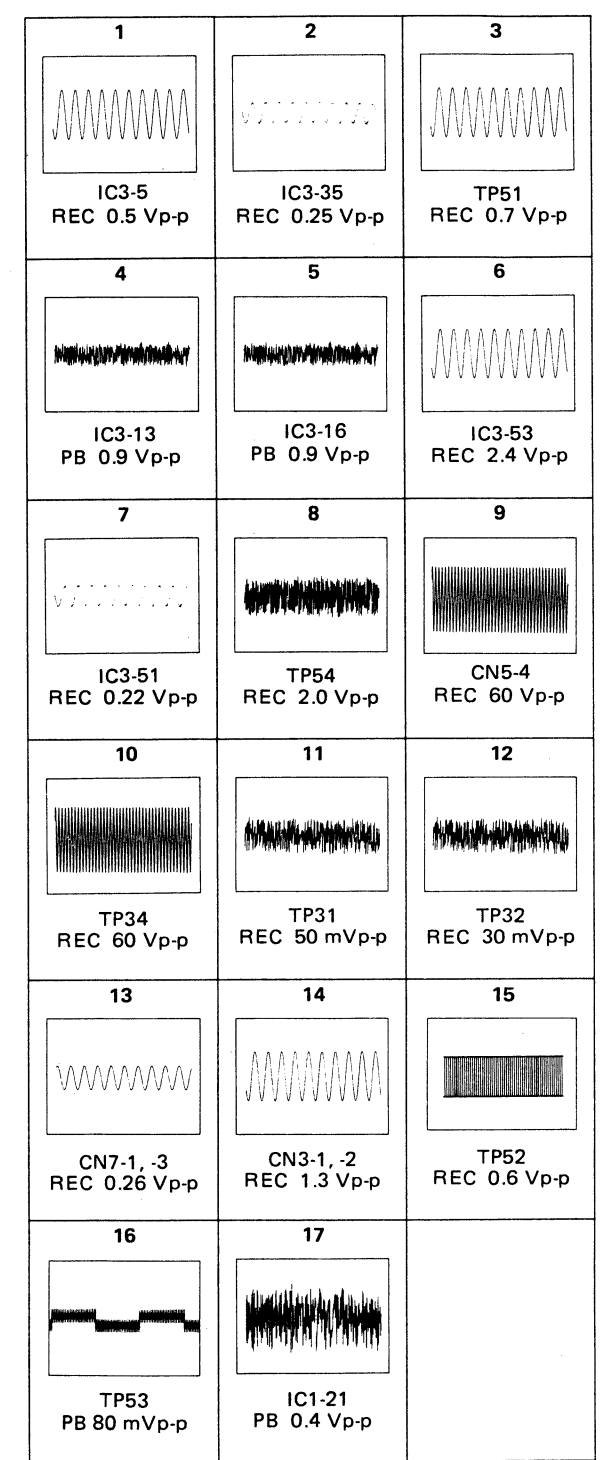
3.25 AUDIO SCHEMATIC DIAGRAM



12-4 2SC1740S(RS)
12-2 DTC143TS



— Waveforms of AUDIO circuit —



6

3.26 AUDIO CIRCUIT BOARD

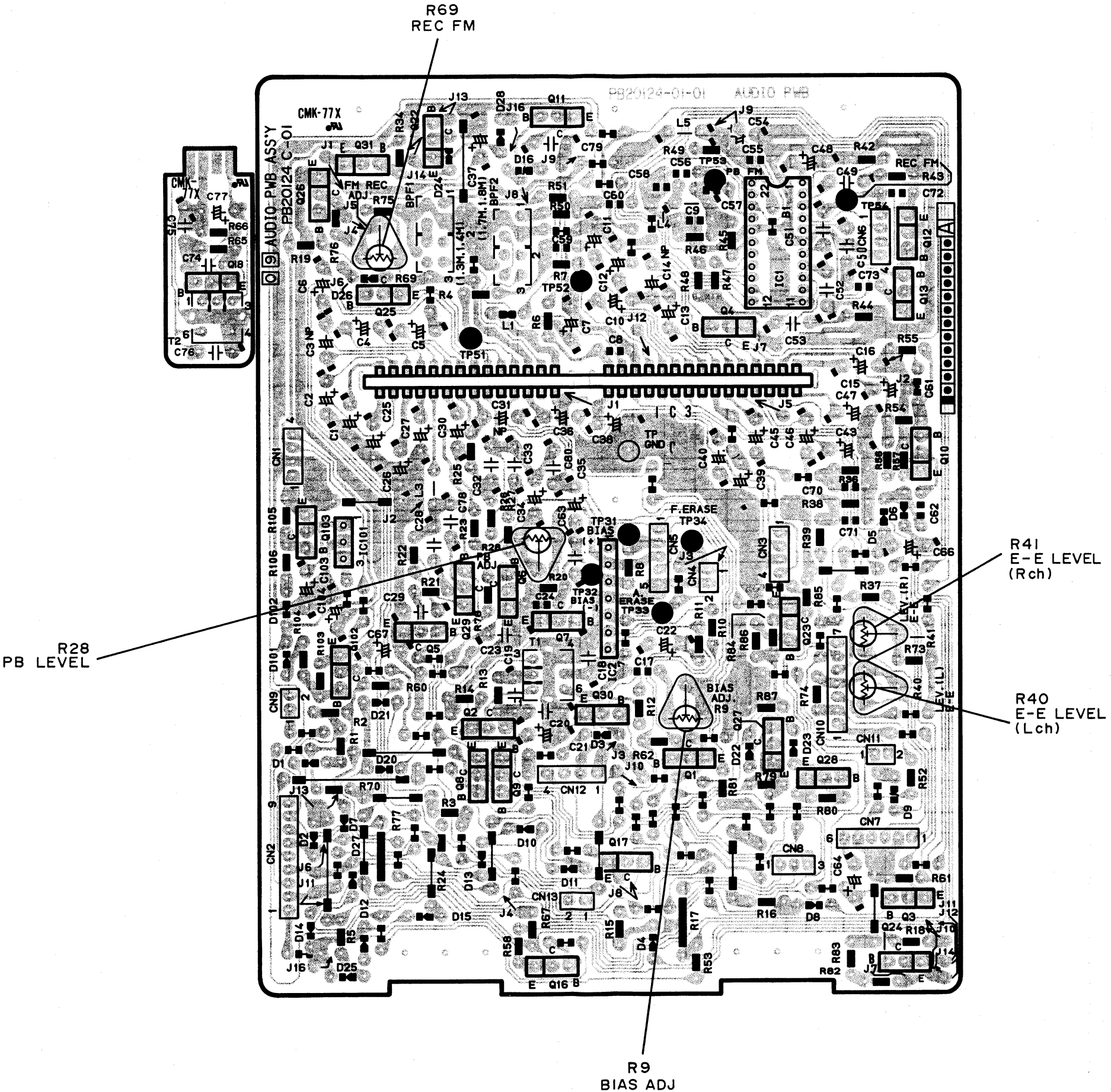
5

4

3

2

1



A

B

C

3-31

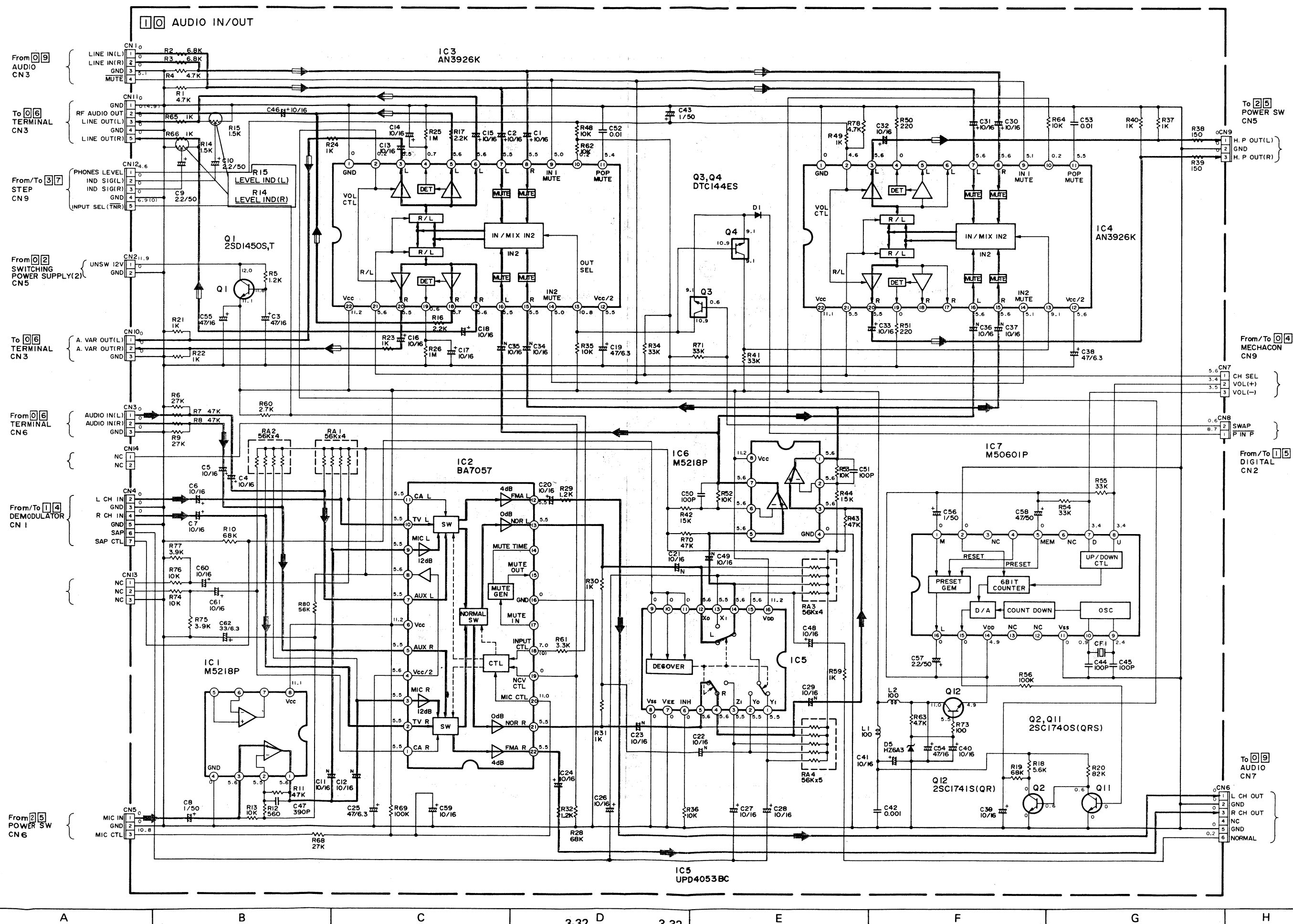
3-31

E

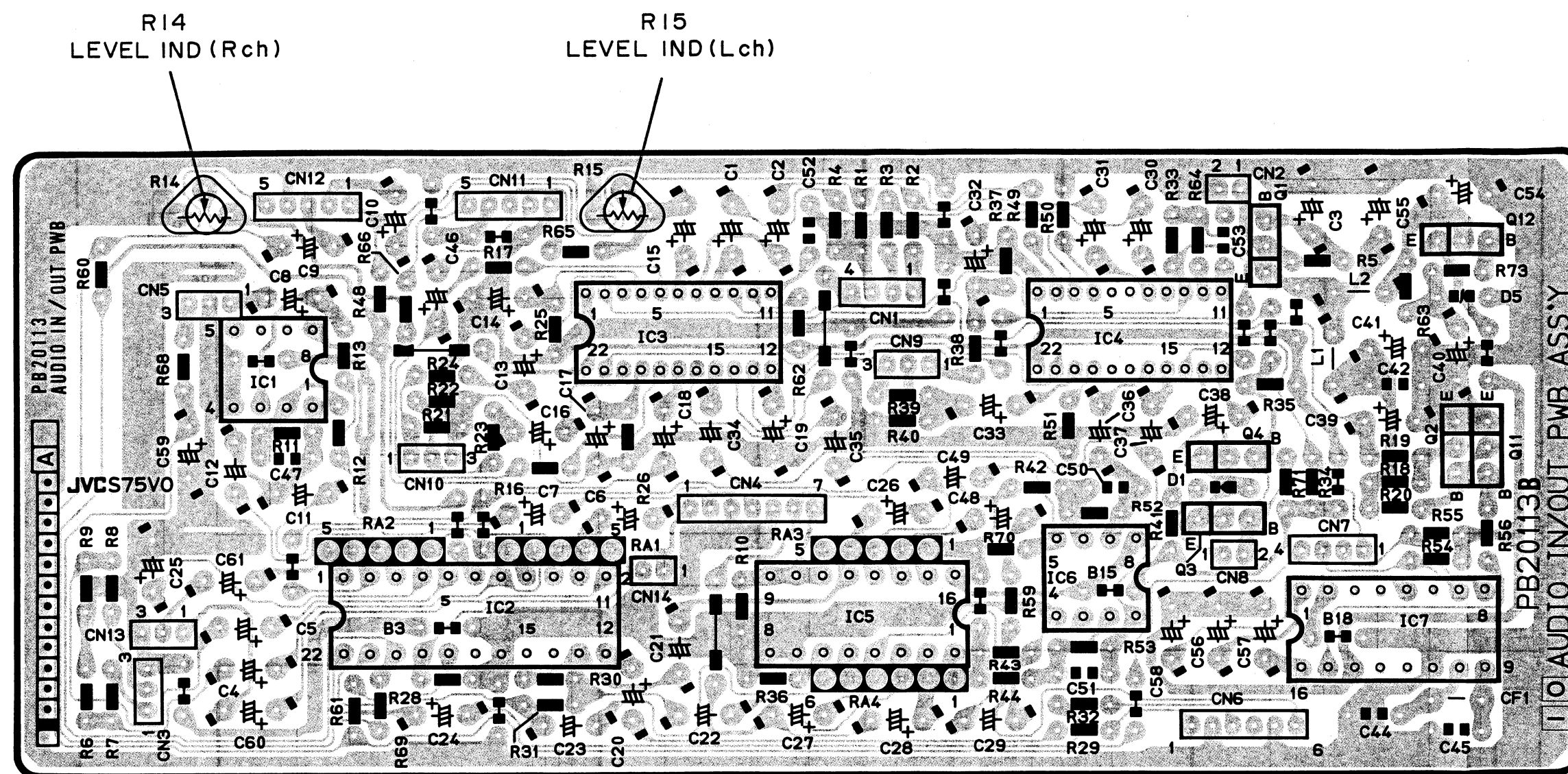
F

G

H



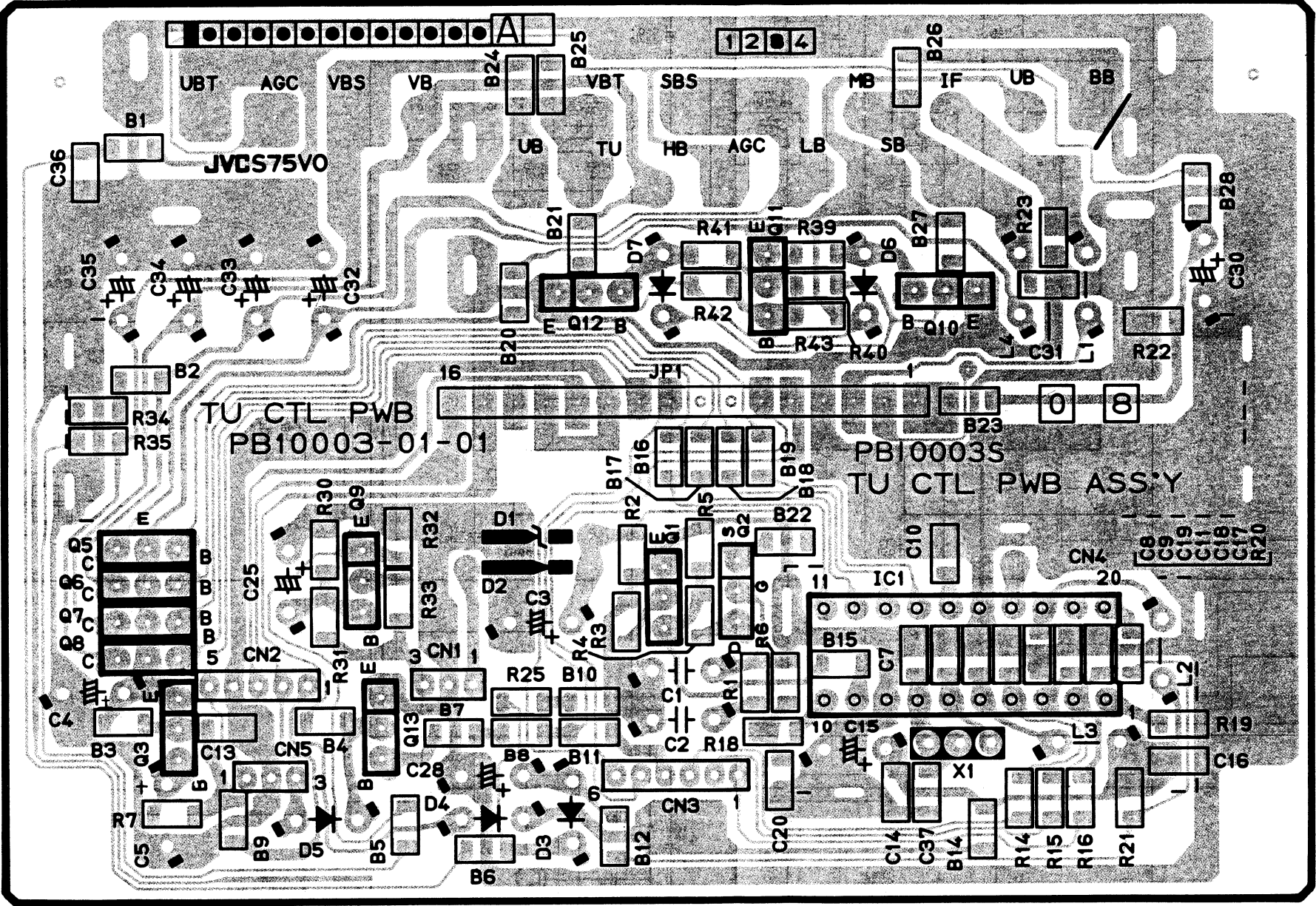
3.28 AUDIO IN/OUT CIRCUIT BOARD



6

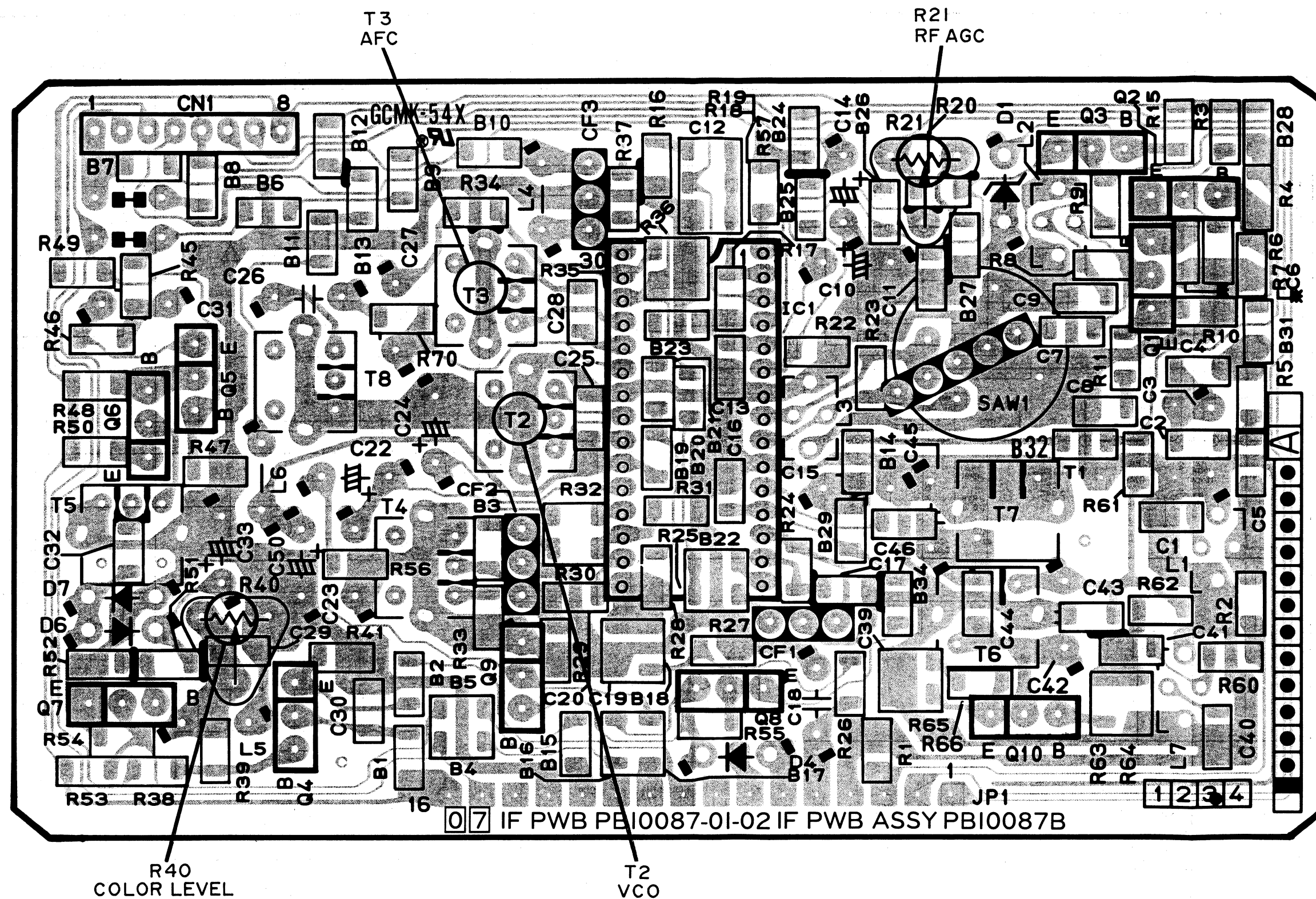


3.30 TUNER CONTROL CIRCUIT BOARD

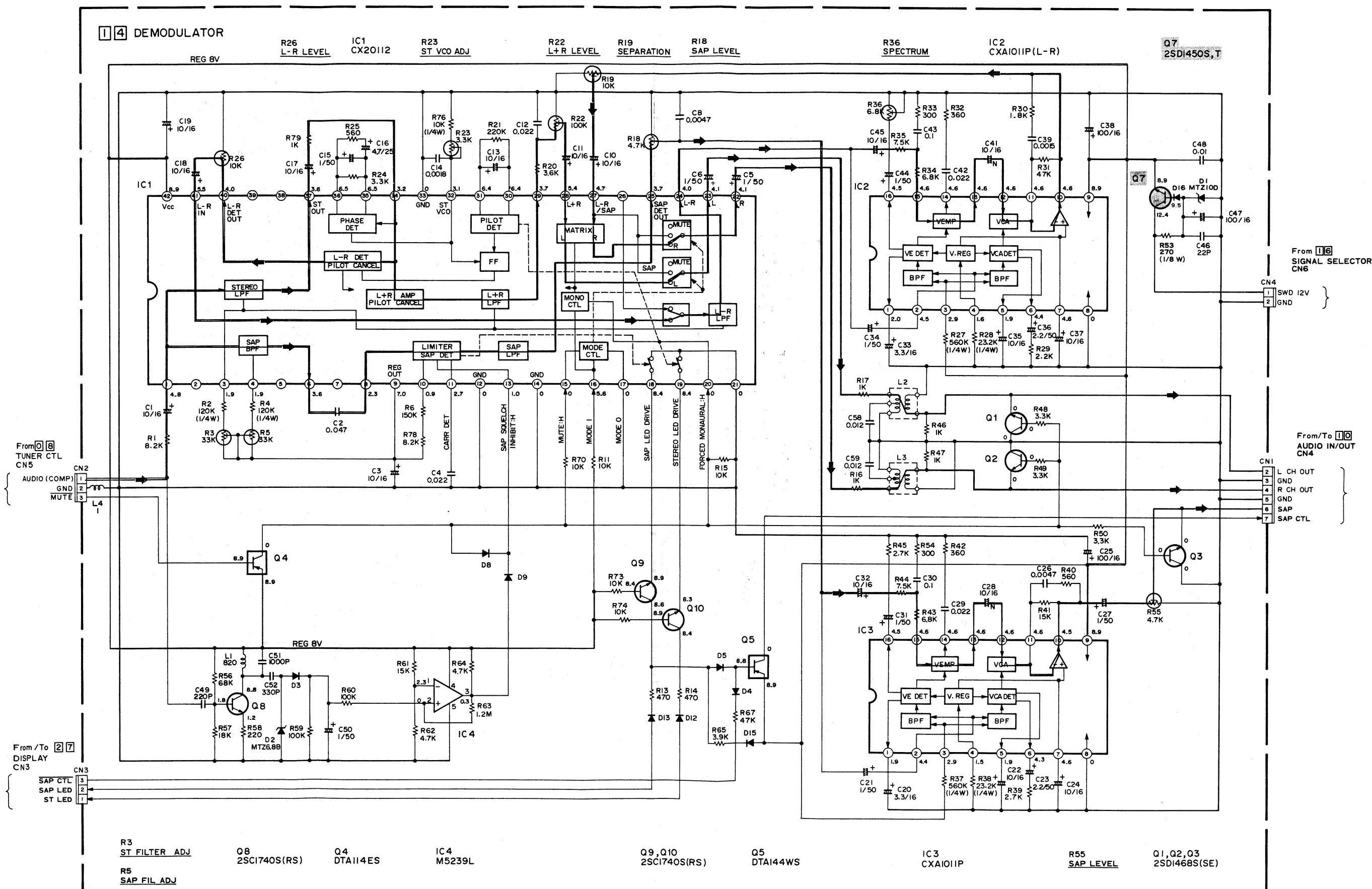




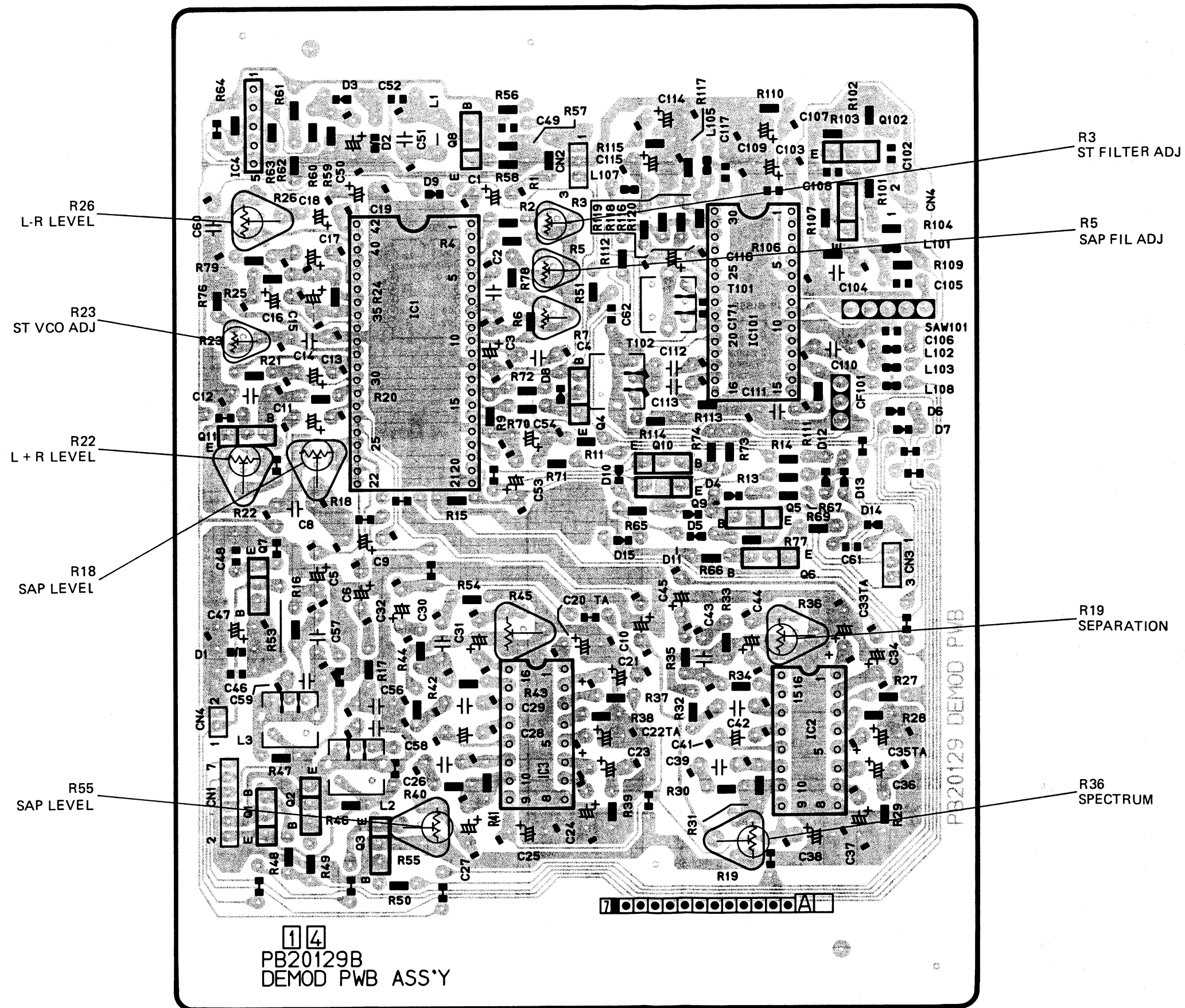
3.32 IF CIRCUIT BOARD



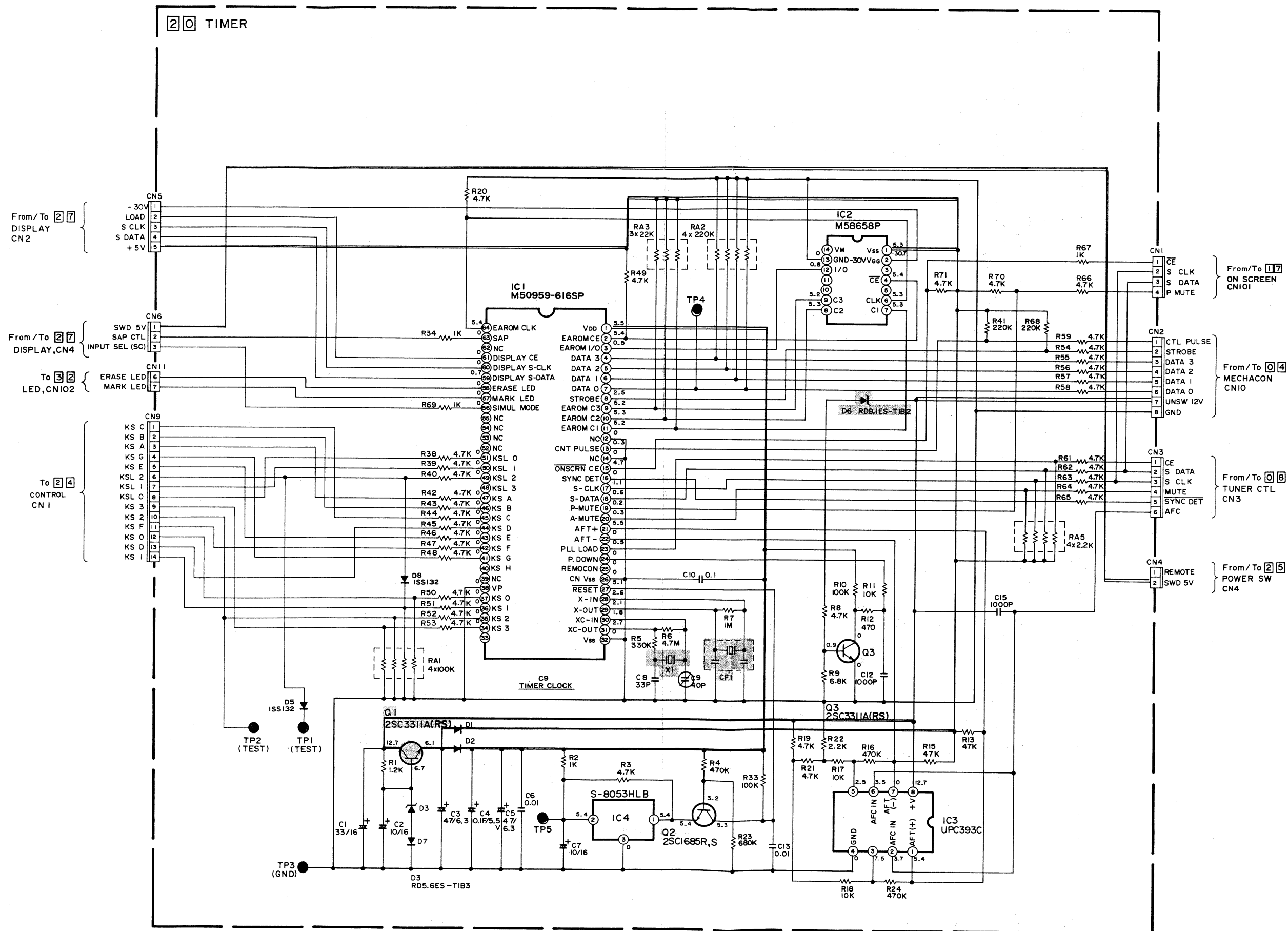
3.33 DEMODULATOR SCHEMATIC DIAGRAM



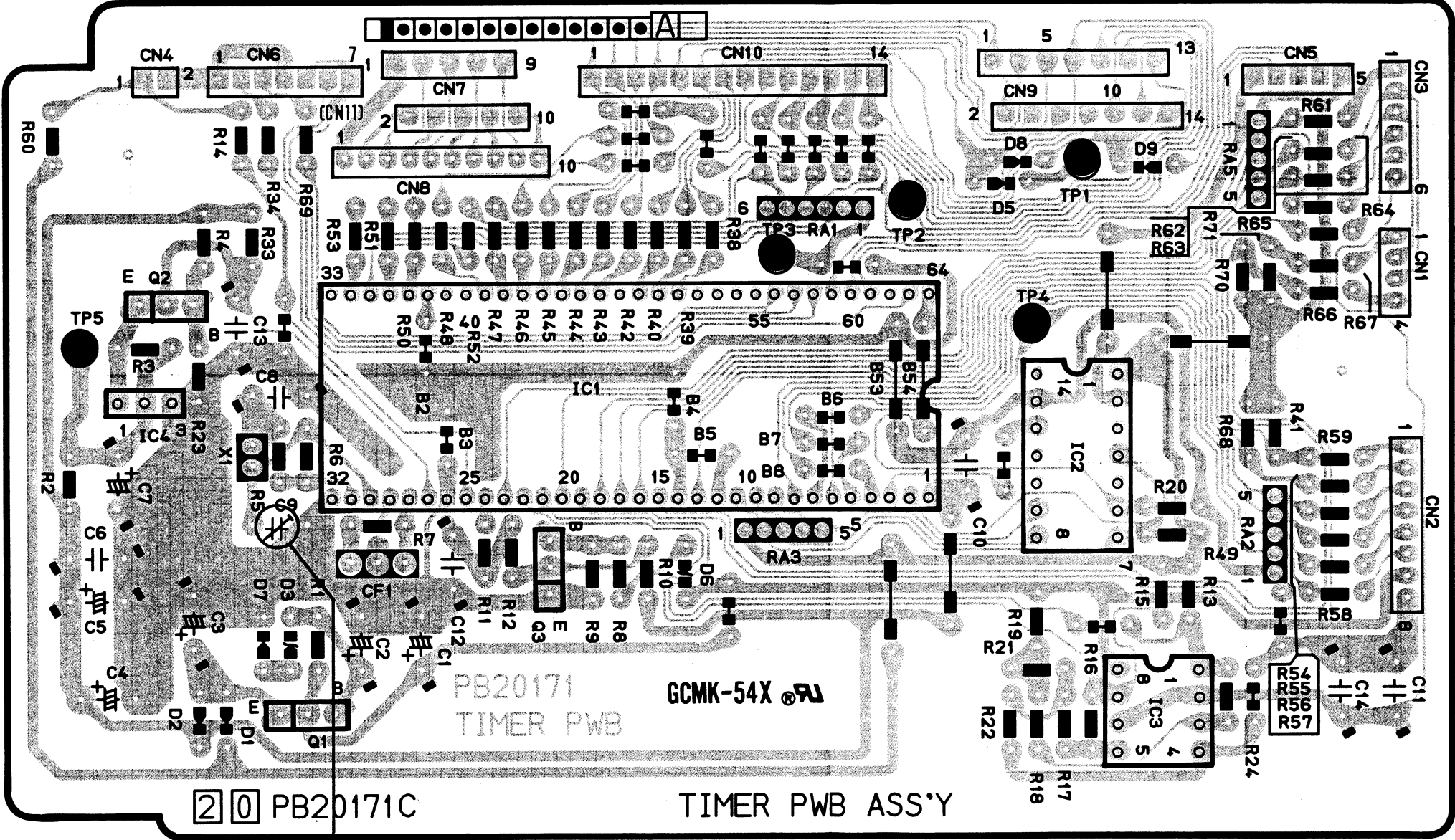
3.34 DEMODULATOR CIRCUIT BOARD



3.35 TIMER SCHEMATIC DIAGRAM

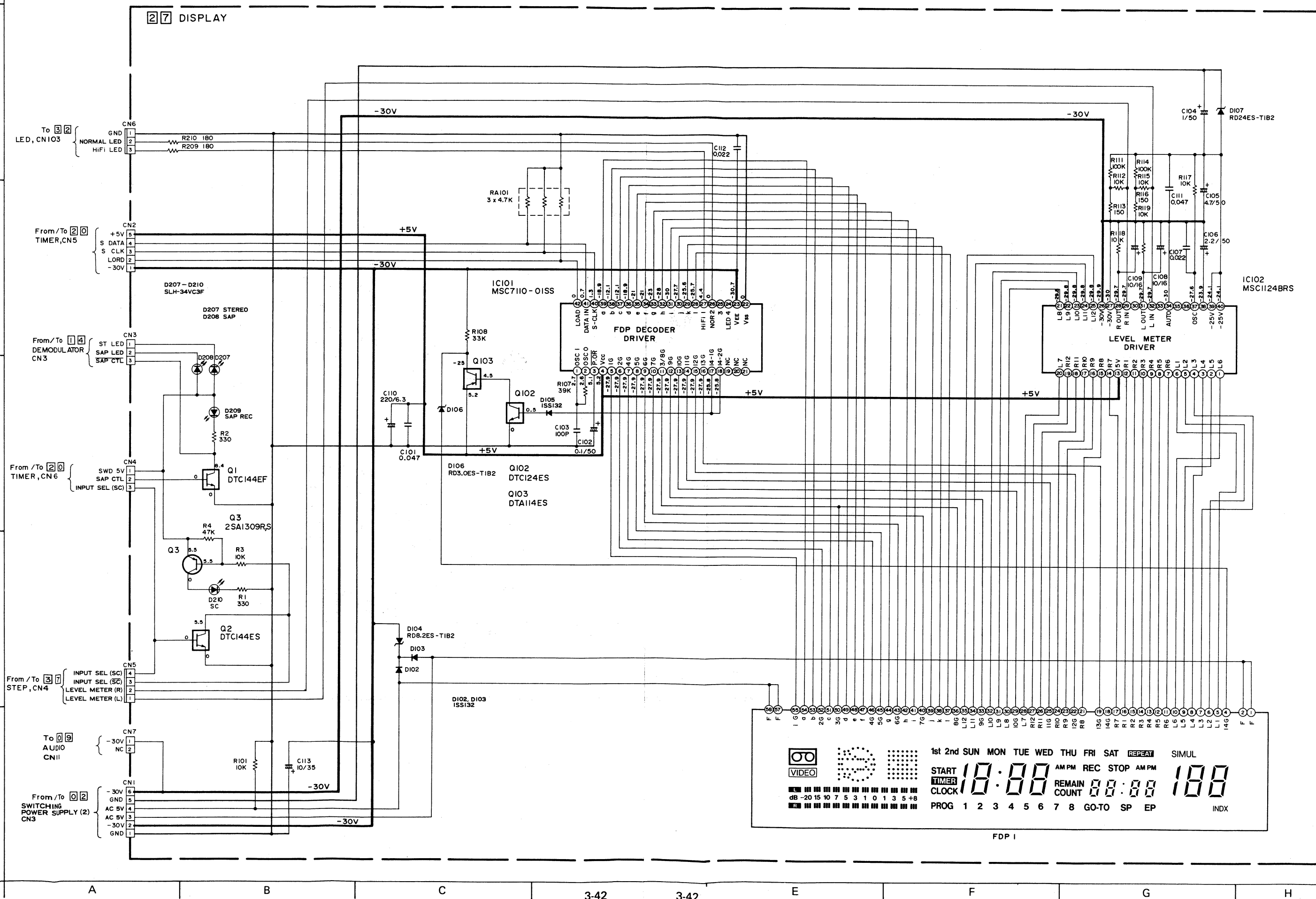


3.36 TIMER CIRCUIT BOARD



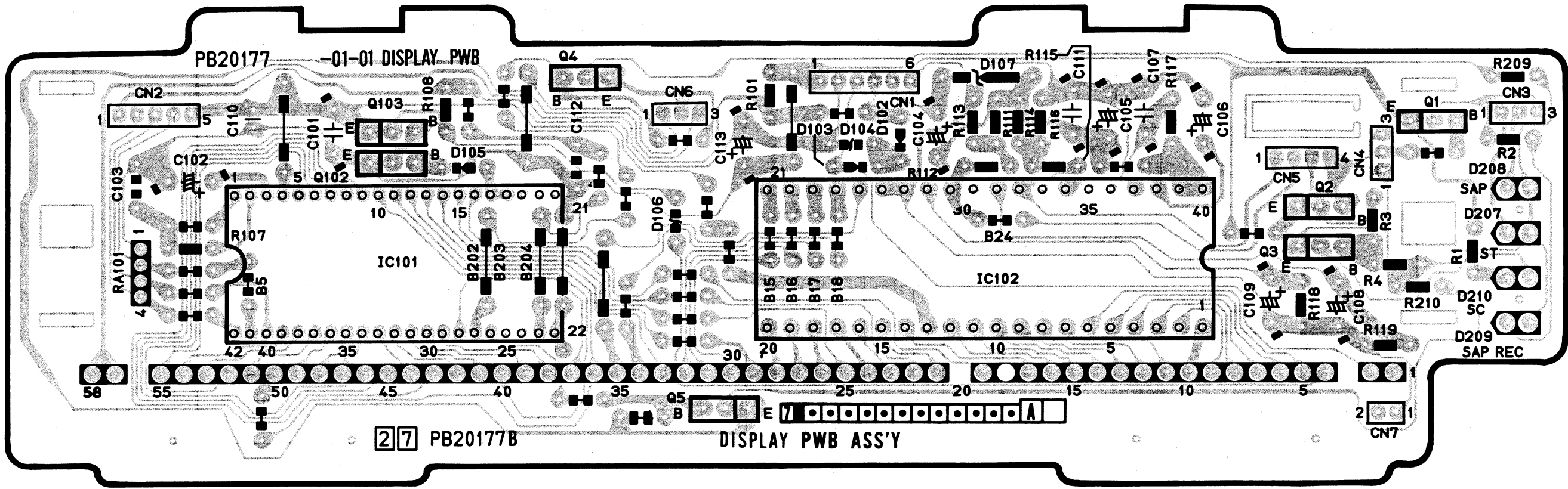
C9
TIMER CLOCK

3.37 DISPLAY SCHEMATIC DIAGRAM



6
5
4
3
2
1

3.38 DISPLAY CIRCUIT BOARD

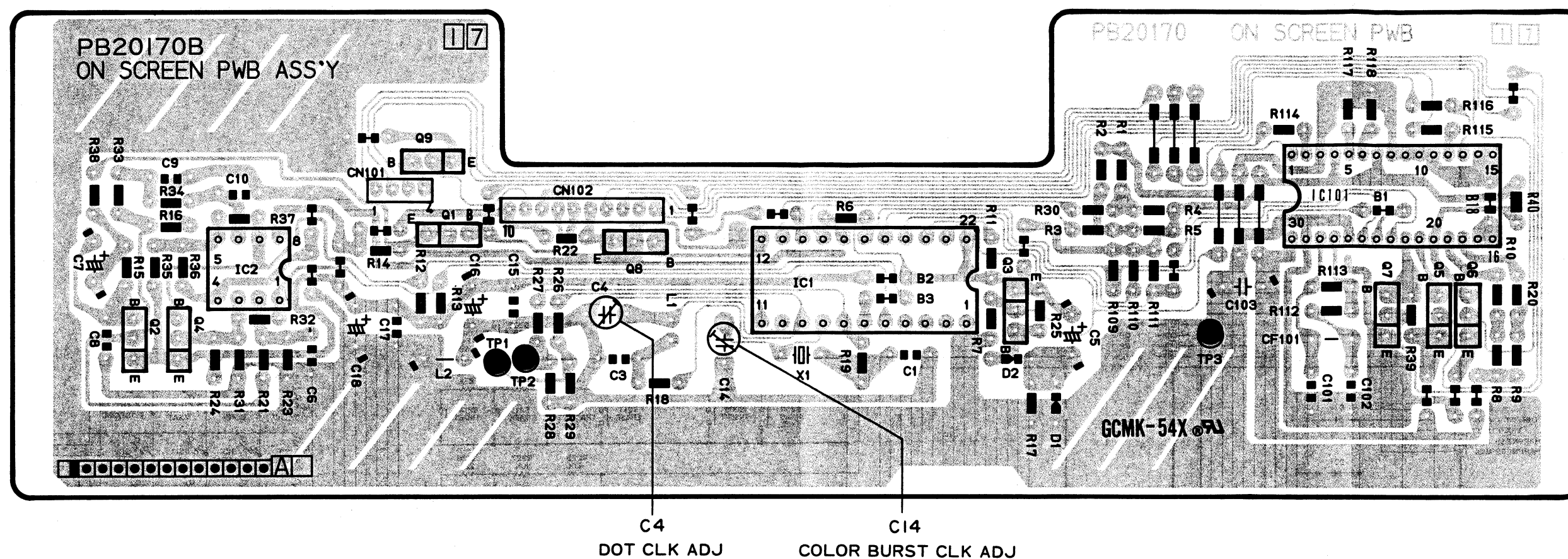


A B C 3-43 3-43 E F G H

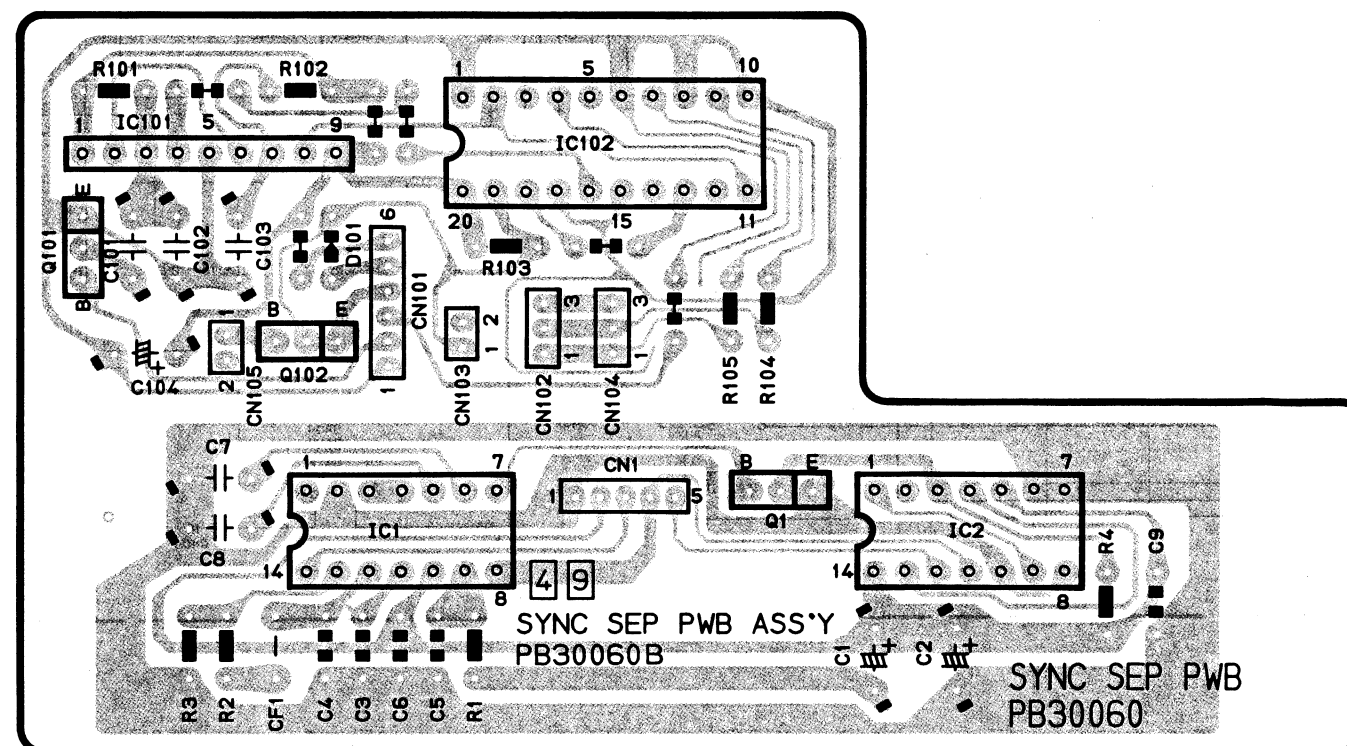


3.40 ON SCREEN AND SYNC SEP/SUB SERVO CIRCUIT BOARDS

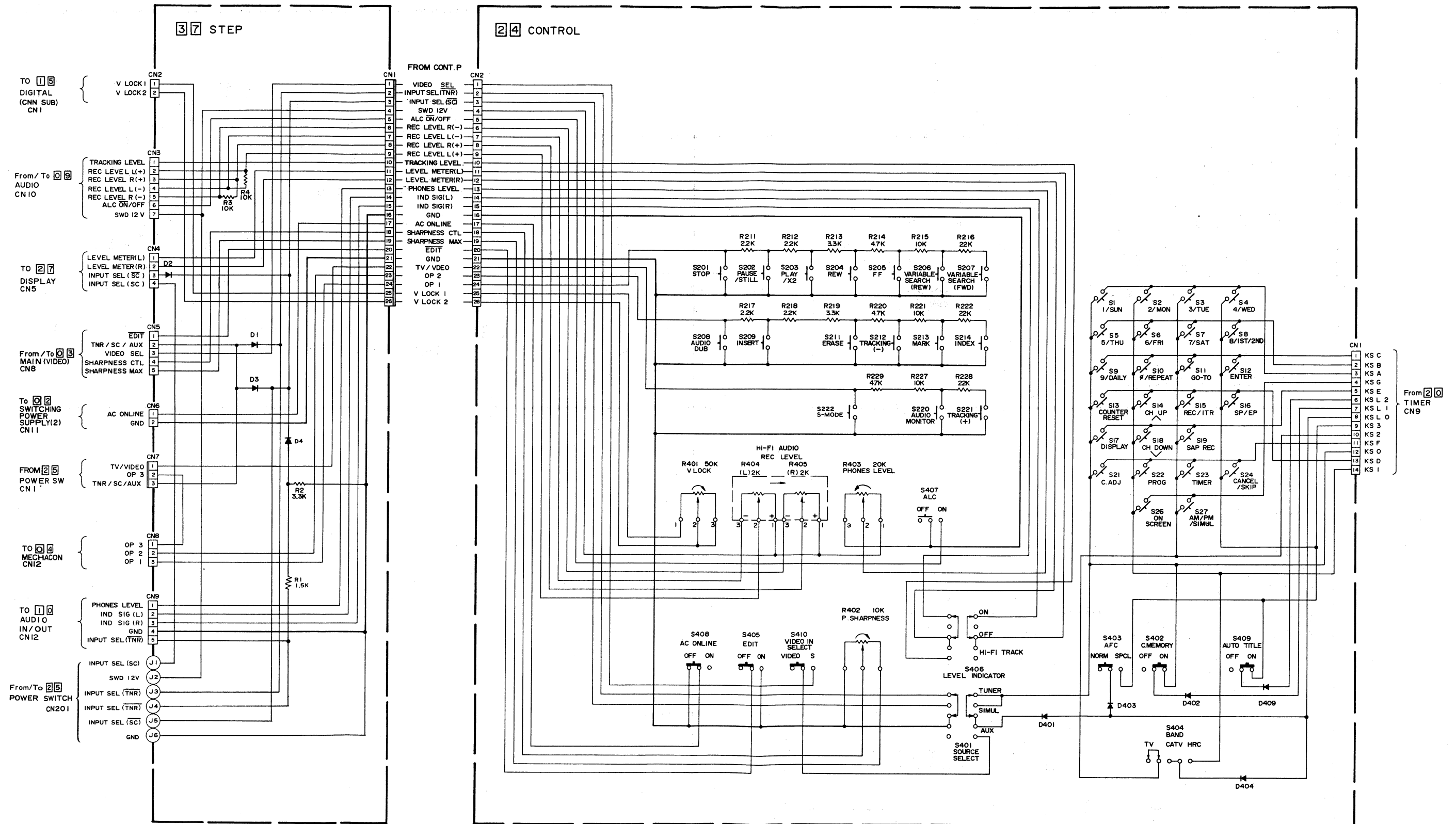
— ON SCREEN —



— SYNC SEP/SUB SERVO —

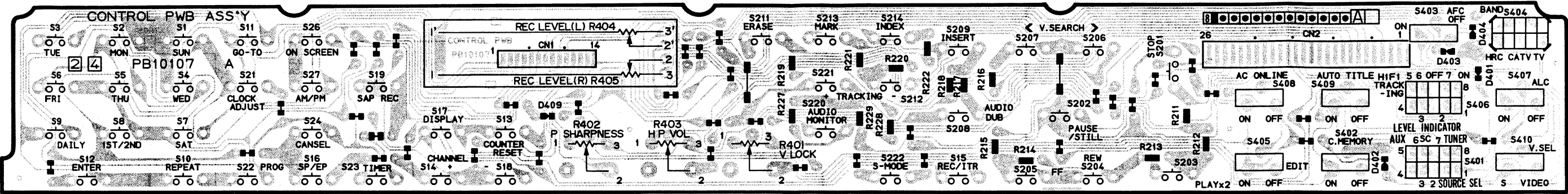


3.41 CONTROL AND STEP SCHEMATIC DIAGRAMS

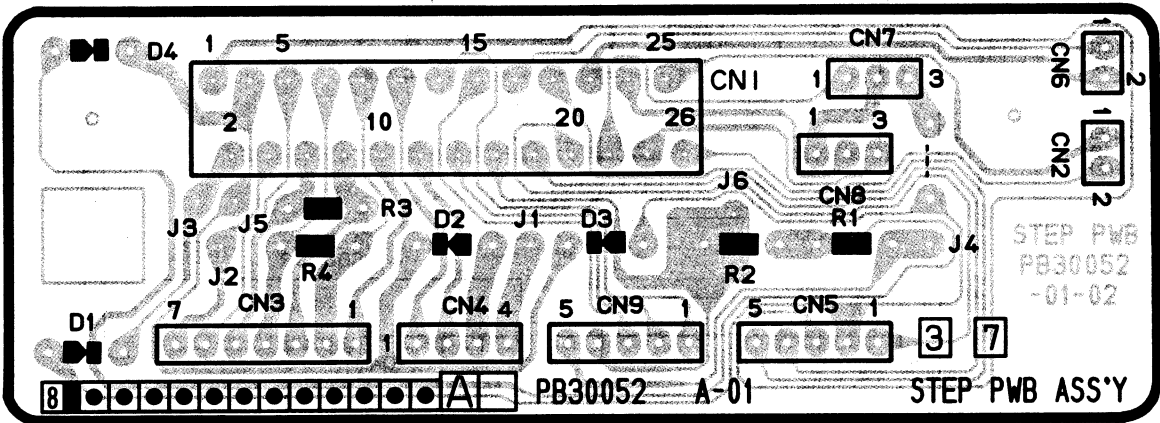


3.42 CONTROL AND STEP CIRCUIT BOARDS

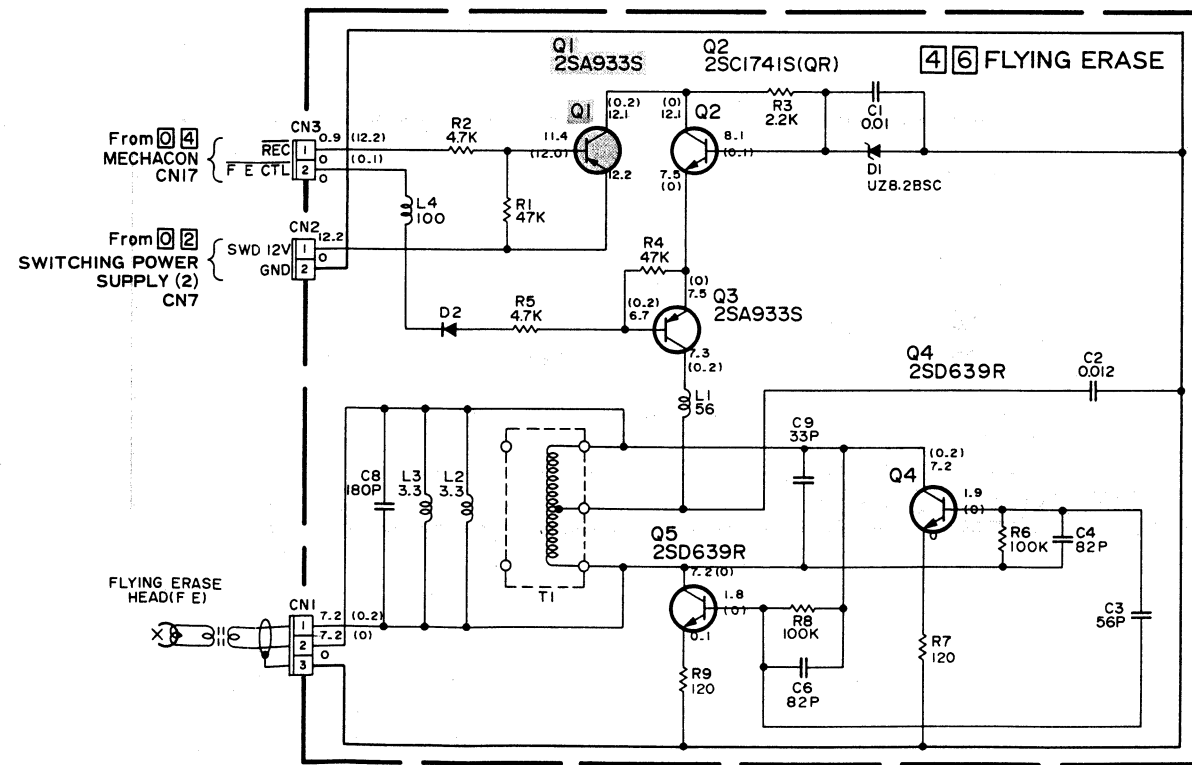
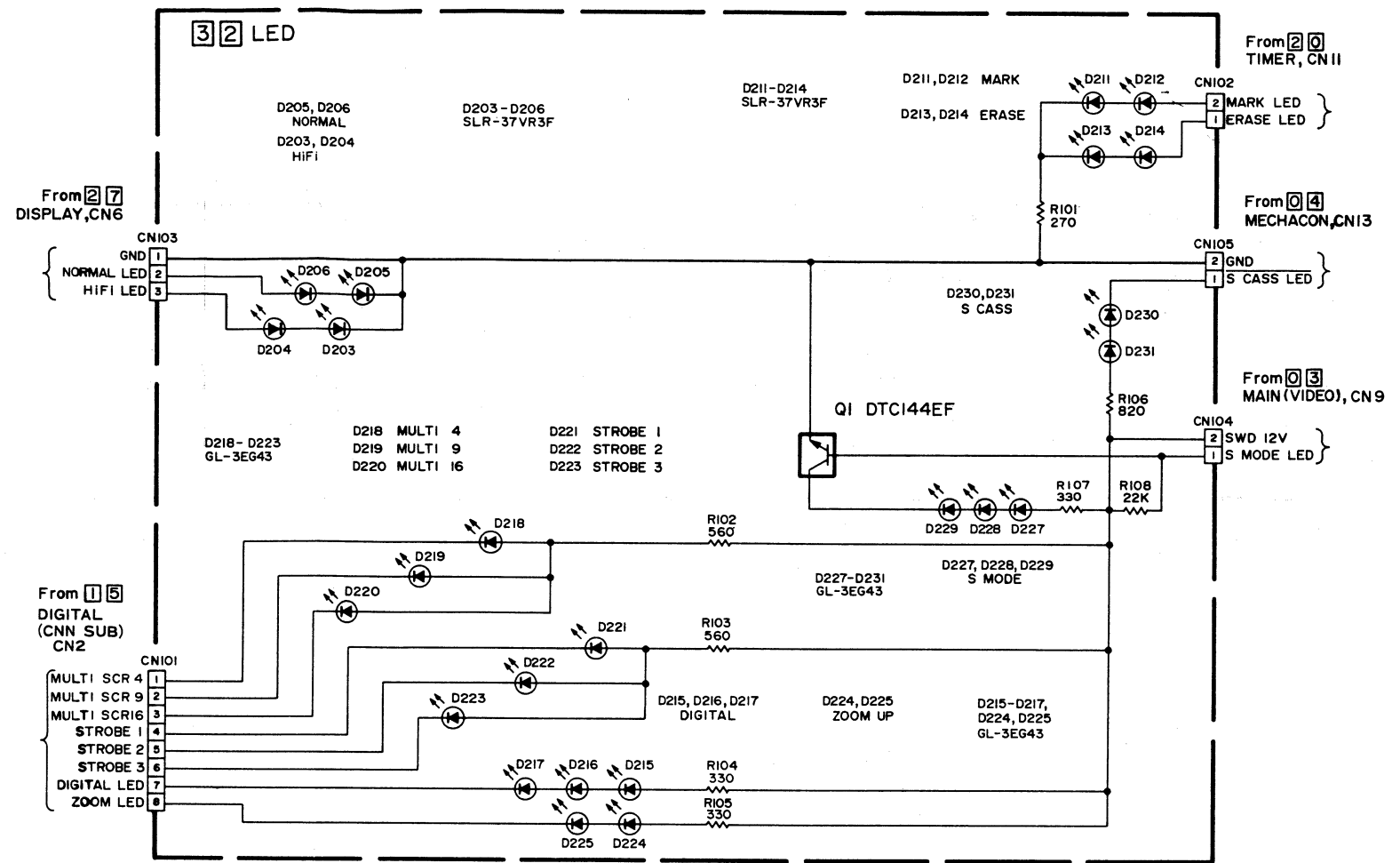
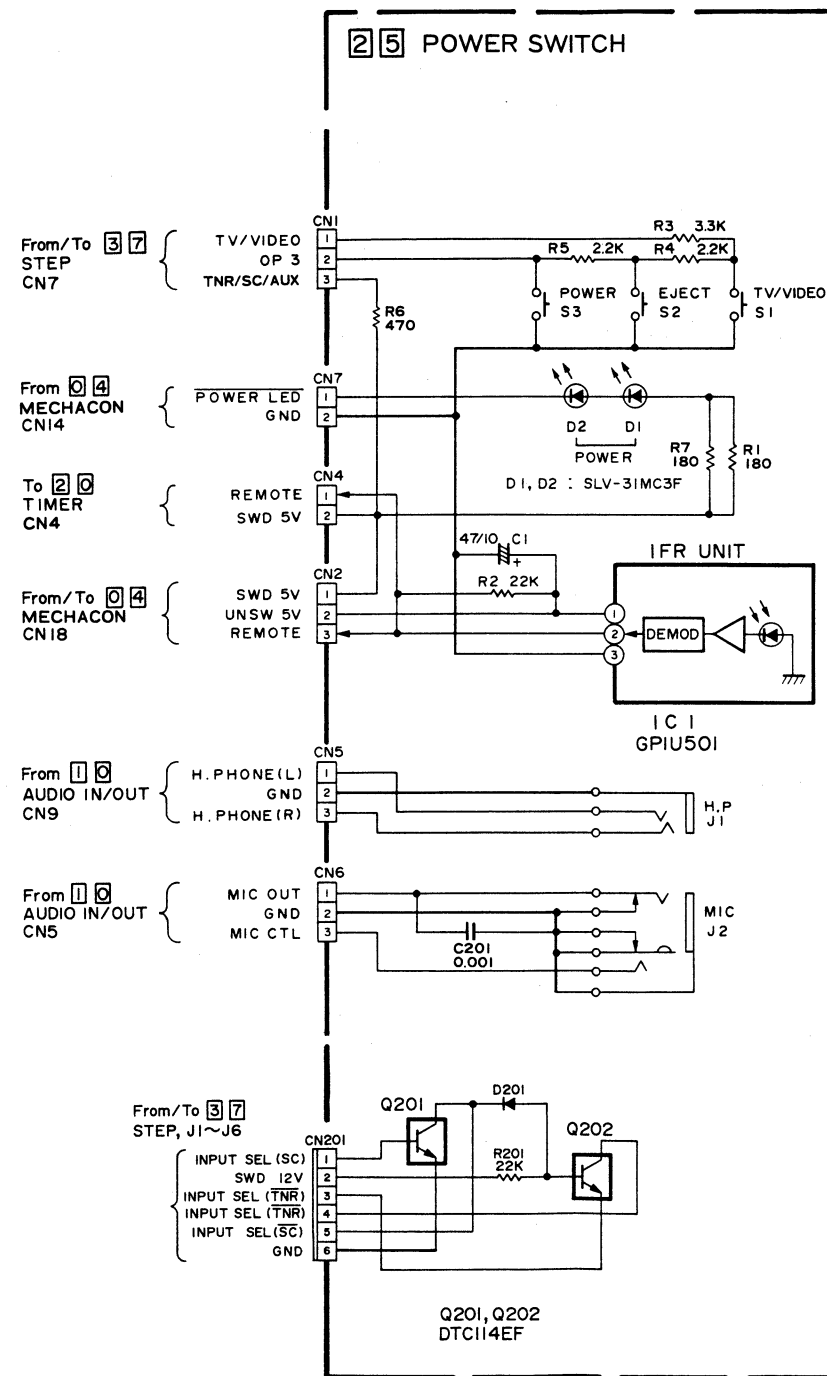
— CONTROL —



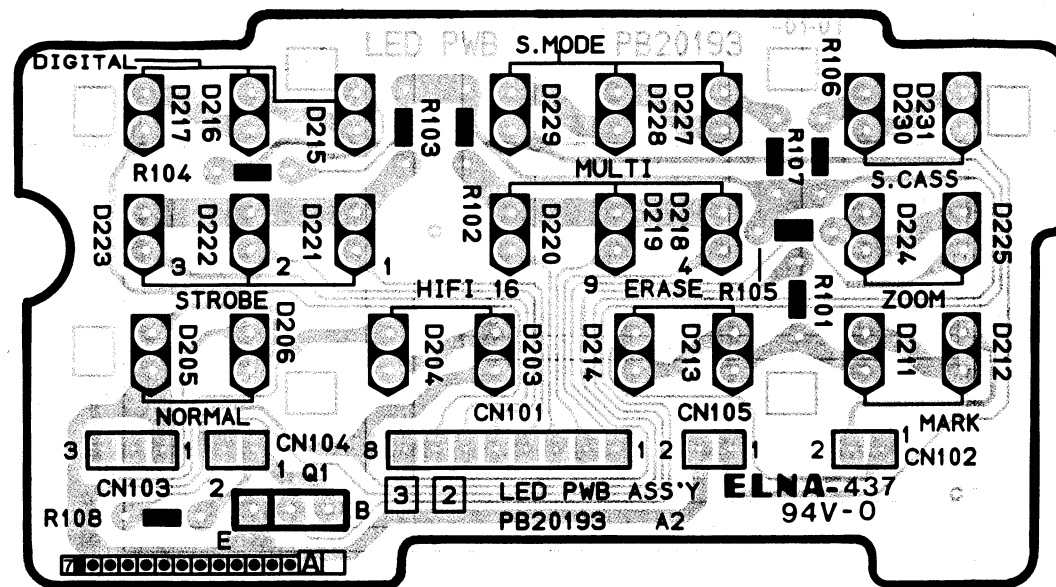
— STEP —



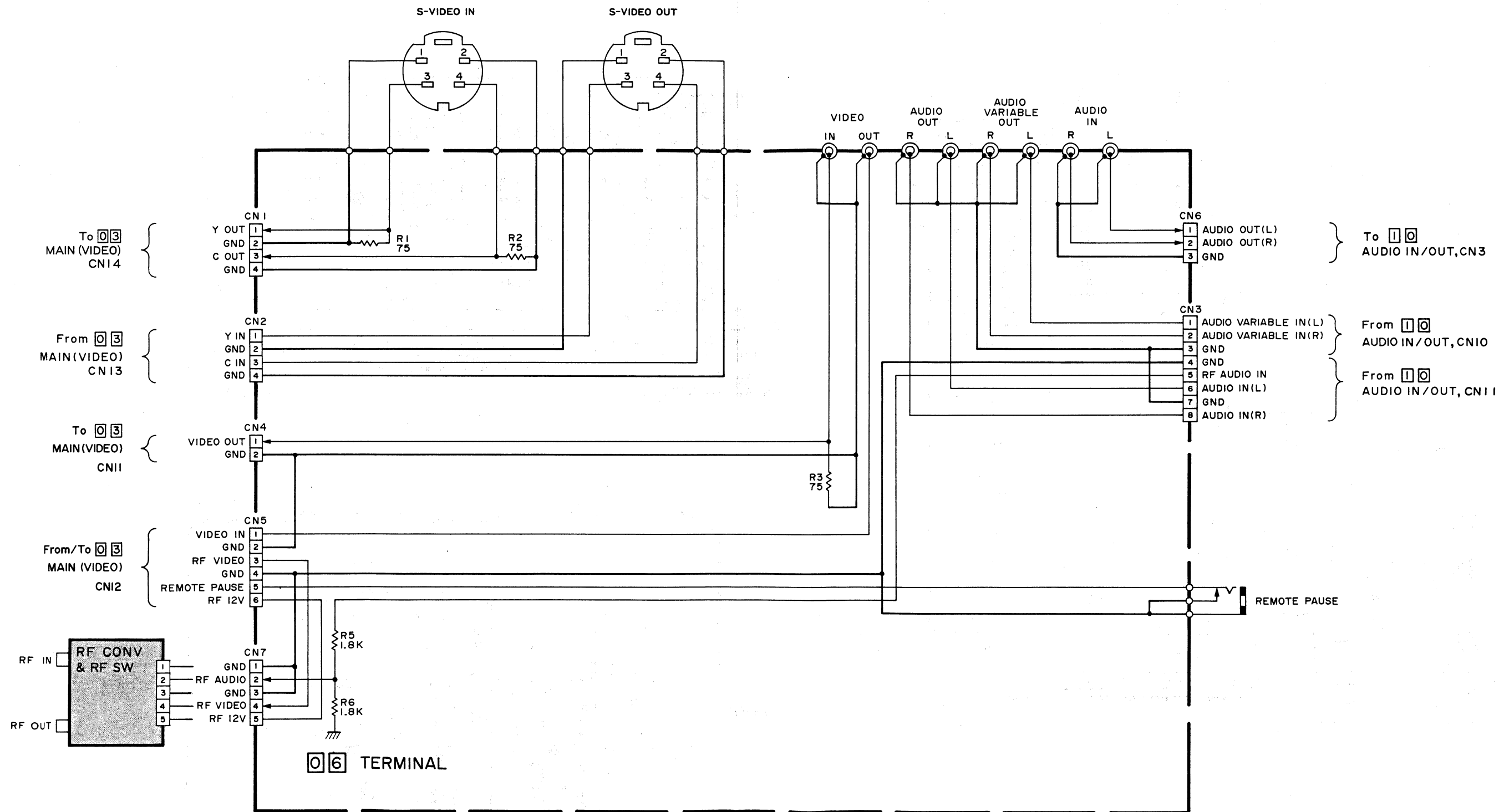
3.43 POWER SWITCH, LED AND FLYING ERASE SCHEMATIC DIAGRAMS



— LED —



3.45 TERMINAL SCHEMATIC DIAGRAM





4

3

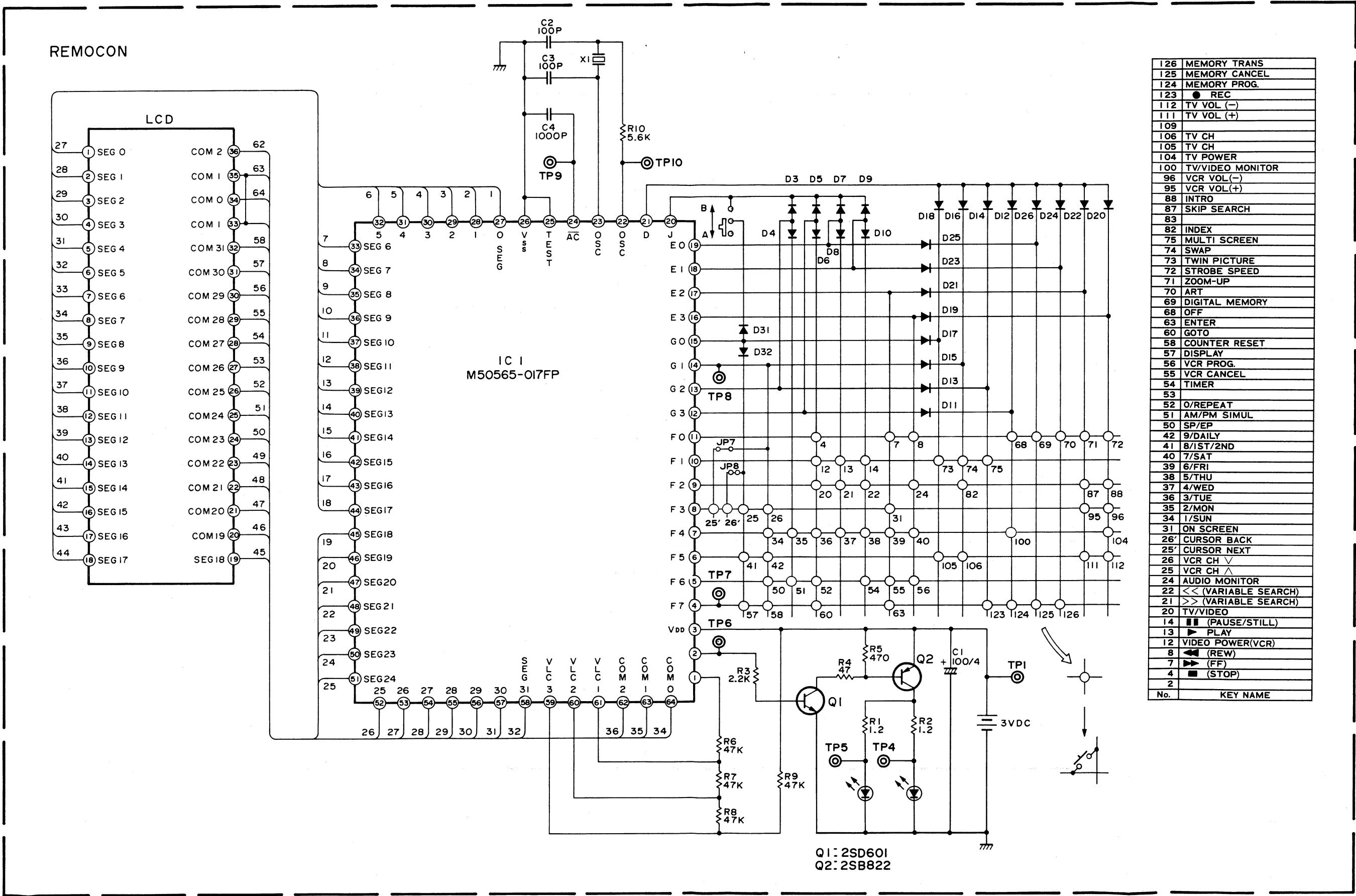
2

1



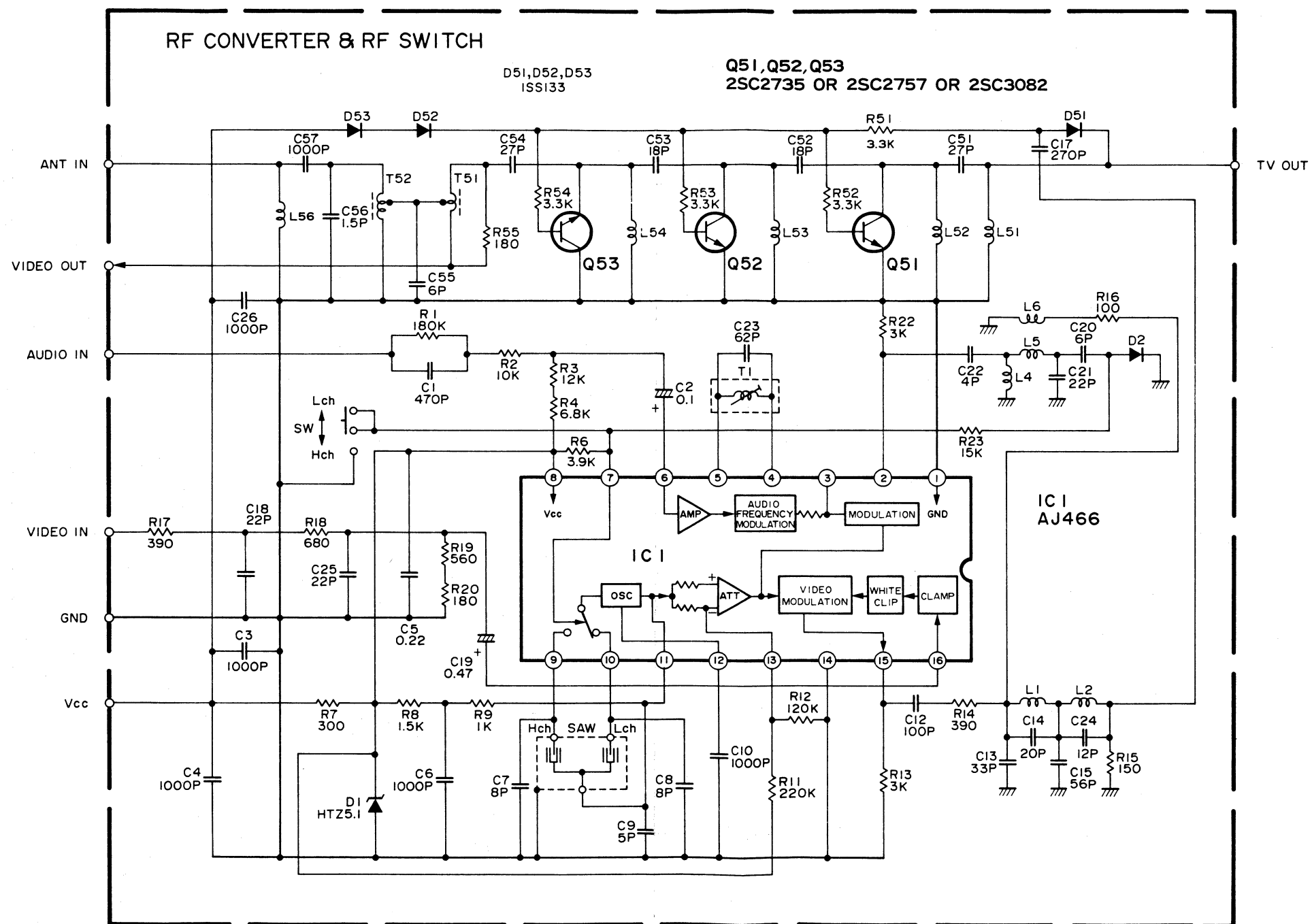
3.48 REMOTE CONTROL SCHEMATIC DIAGRAM

NOTE:
All parts shown in this schematic are critical for safety.
Replace only with specified part numbers.



3.49 RF CONVERTER AND RF SWITCH SCHEMATIC DIAGRAM

- NOTES:** 1. All parts shown in this schematic are critical for safety.
2. This schematic is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.



SECTION 4

EXPLODED VIEWS AND PARTS LIST

SAFETY PRECAUTION

Parts identified by the $\triangle$ symbol are critical for safety. Replace only with specified part numbers.

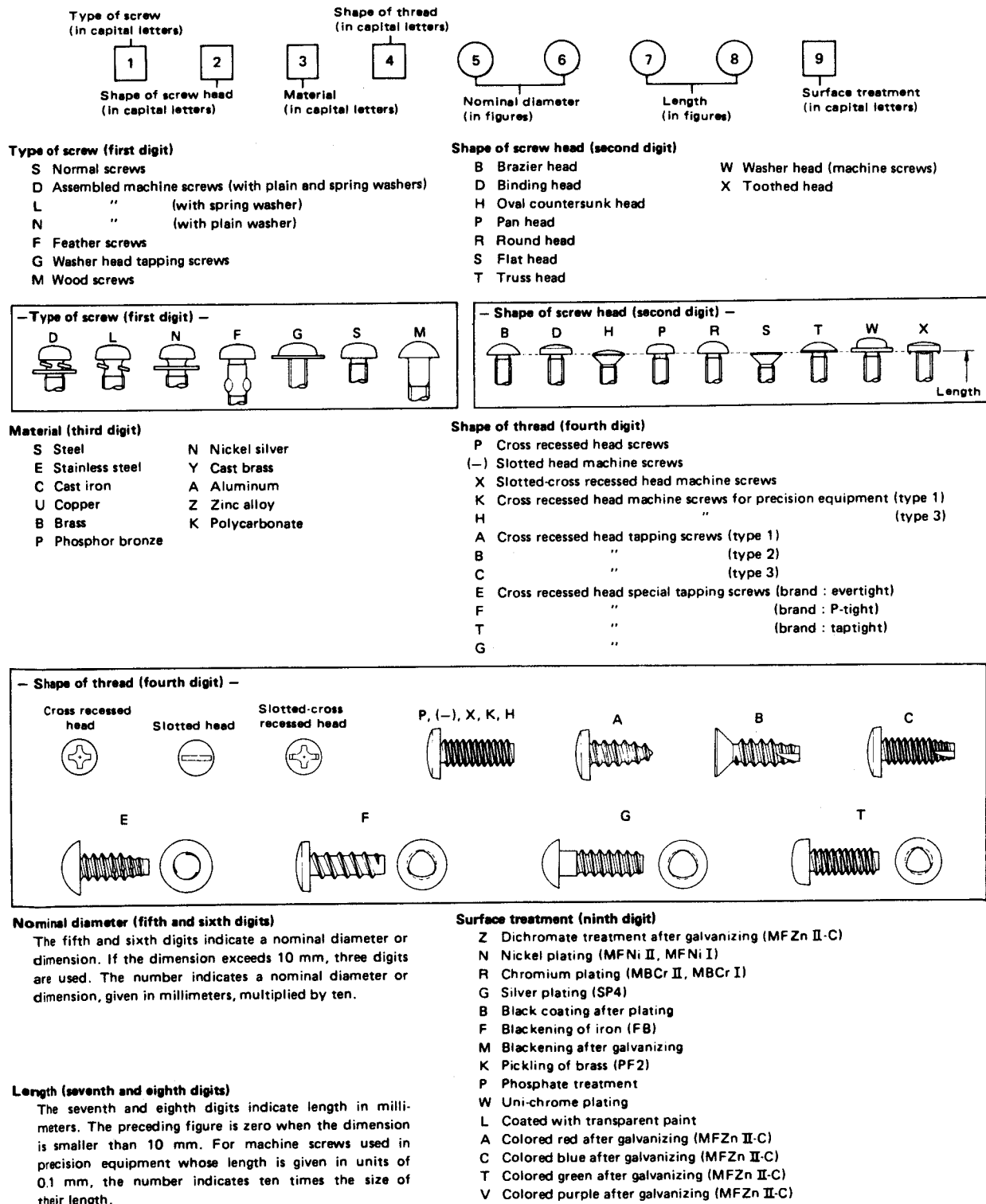
NOTE:

[M] indicates mechanical symbol number.

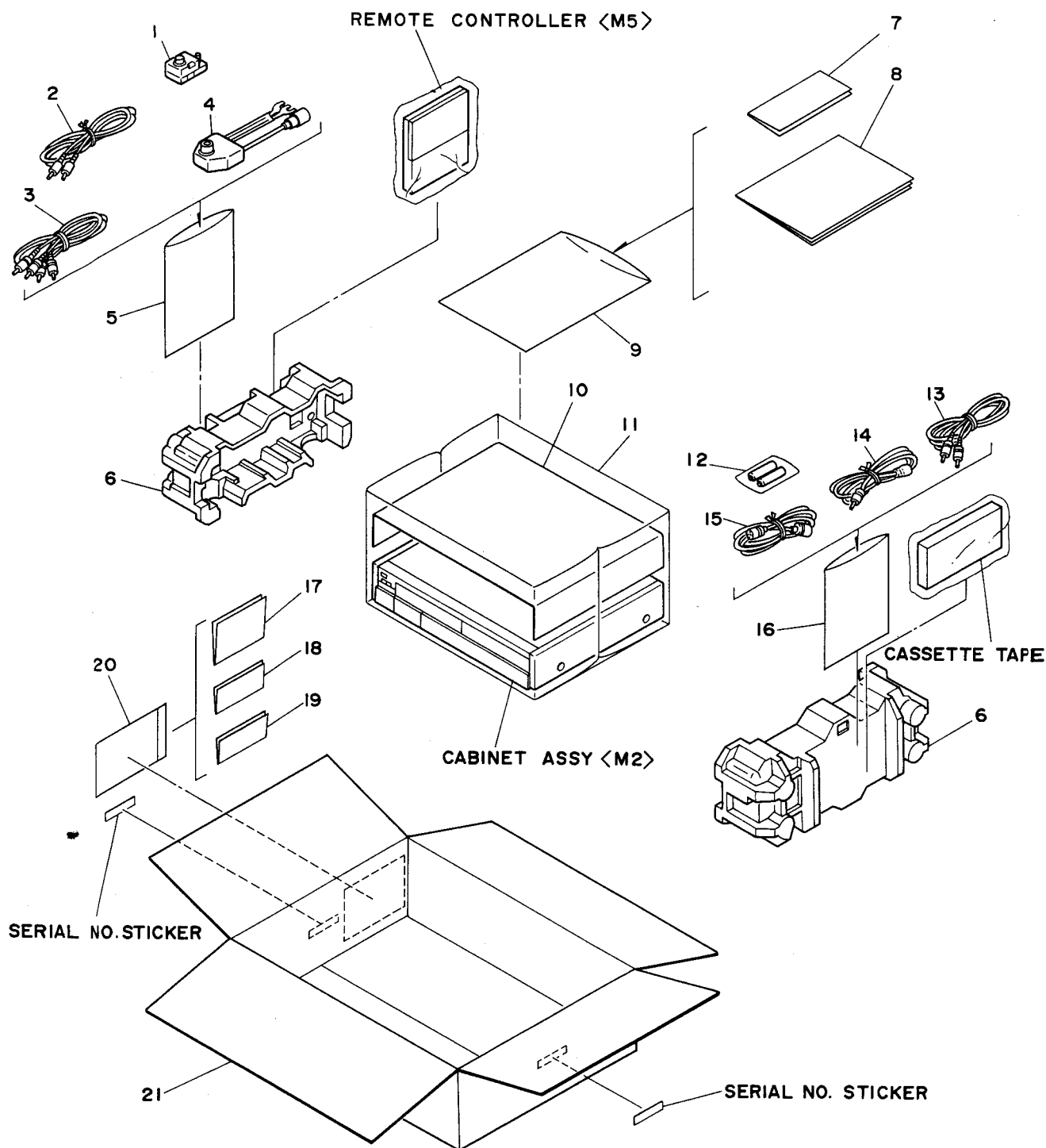
4.1 STANDARD PART NUMBER CODING

4.1.1 Screw coding

Standard screw part numbers are as follows.



4.5 PACKING ASSEMBLY <M1>



#△ REF NO. PART NO. PART NAME, DESCRIPTION

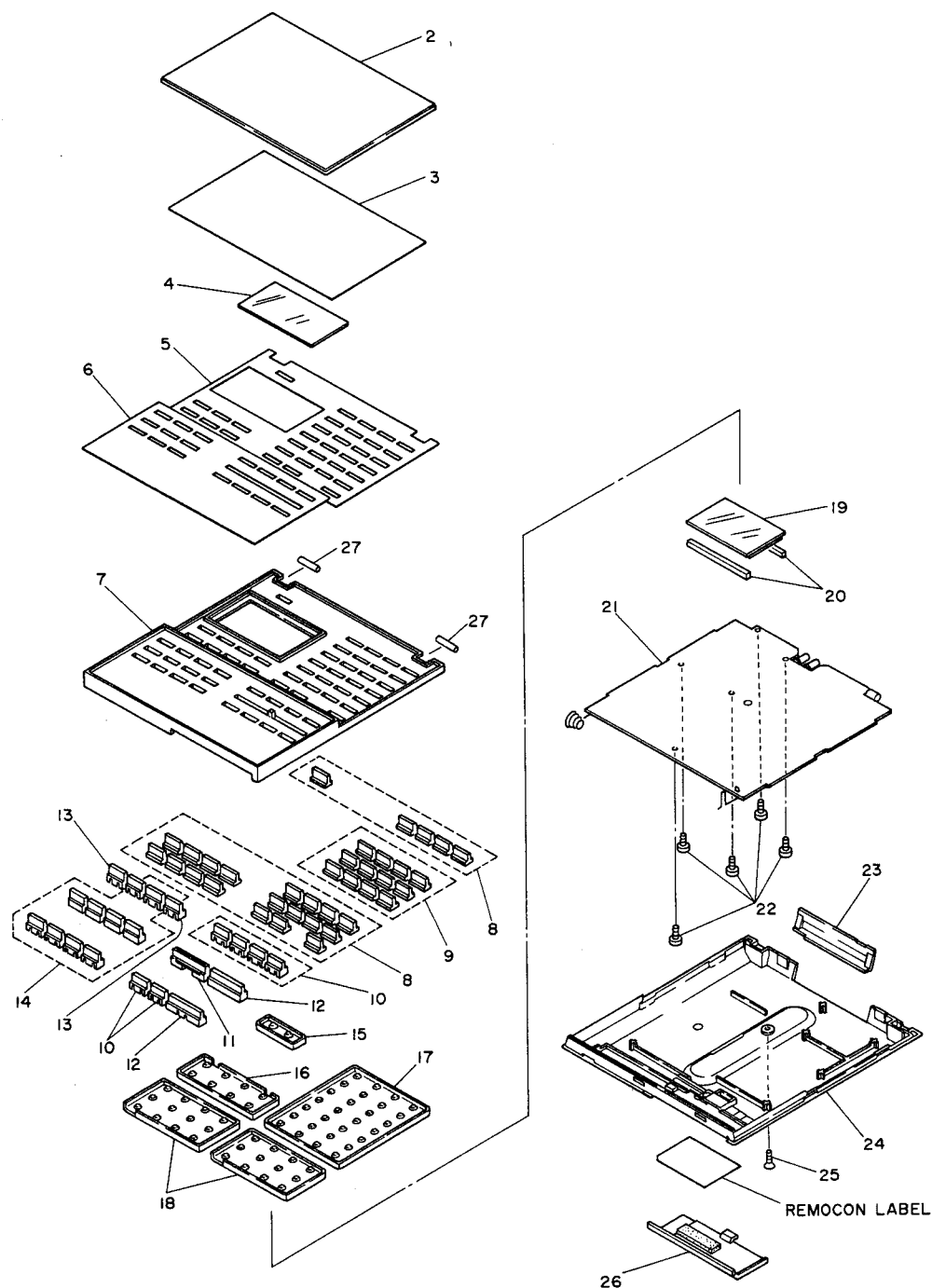
* 1. PACKING ASSEMBLY <M1> *

△ 1	PU35613-2	MATCHING TRANSFORMER
△ 2	OR PU59135-2	MATCHING TRANSFORMER
2	PU60111	DIN CABLE
3	PU56142-3	PIN CORD ASSY
△ 4	PU59610-2	ANTENNA SPLITTER
5	QPGA020-02003	POLY BAG
6	PQ32215B	CUSHION ASSY
△ 7	PU33941-3-2	SAFETY CAUTION
8	PU30425-963	INSTRUCTIONS, CANADA
△	PU30425-962	INSTRUCTIONS, U. S. A.

#△ REF NO. PART NO. PART NAME, DESCRIPTION

9	QPGA025-03505	POLY BAG
10	PU57777-6	WADDING PAPER
11	PQM30021-70	POLY BAG
12	UM-3DJ2P	BATTERY, X2
13	PU59205-3	PIN JACK CABLE
△ 14	PU59167-4	RF CABLE
△ 15	PU59167-2	RF CABLE
△	OR PU59168-2	RF CABLE
16	QPGA020-02003	POLY BAG
17	BT-20025J	WARRANTY CARD, CANADA
	BT-20062	WARRANTY CARD, U. S. A.
18	BT-20046C	TOLL FREE CARD, U. S. A.
19	BT-20071A	INSTRUCTION GUIDE, CANADA
20	PU54821	POLY BAG
21	PQ32389-2	PACKING CASE, CANADA
	PQ32389	PACKING CASE, U. S. A.

4.6 REMOTE CONTROL UNIT <M5>



REF NO.	PART NO.	PART NAME, DESCRIPTION

* 5. REMOTE CONTROL UNIT <M5> *		

Δ 1	PQ10607B	REMOTE CONTROLLER, INCL. 2-27
2	PQ32134-2	DOOR
3	PU36437-2	INST LABEL
4	PQ43244	LCD WINDOW
5	PQ32135-2	10 KEY PLATE
6	PQ32136-2	OPERATION PLATE
7	PQ32131	UPPER CASE
8	PQ10607-5	BUTTON (BLACK), X24
9	PQ10607-6	BUTTON (GRAY), X12
10	PQ10607-7	BUTTON (GRAY), X6

*Δ REF NO.	PART NO.	PART NAME, DESCRIPTION
11	PQ10607-8	BUTTON (GRAY/RED)
12	PQ10607-9	BUTTON (GRAY), X2
13	PQ10607-10	BUTTON (BLUE), X2
14	PQ10607-11	BUTTON (BLACK), X10
15	PQ10607-12	RUBBER SHEET (D)
16	PQ10607-13	RUBBER SHEET (C)
17	PQ10607-14	RUBBER SHEET (A)
18	PQ10607-15	RUBBER SHEET (B), X2
19	PQ10607-18	LCD
20	PQ10543-015	CONNECTOR, X2
21	—	REMOCON BOARD ASSY, REF. <RM>
22	SDST2005Z	TAPPING SCREW, X5
23	PQ10607-19	WINDOW
24	PQ32132	LOWER CASE
25	SSSP2006B	SCREW
26	PQ32133	BATTERY CAP
27	PQ10607-20	SPRING PIN, X2

SECTION 5

ELECTRICAL PARTS LIST

SAFETY PRECAUTION

Parts identified by the $\triangle$ symbol are critical for safety. Replace only with specified part numbers.

ABBREVIATIONS IN THIS LIST ARE AS FOLLOWS:

RESISTORS—All resistance values are in ohms (Ω), unless otherwise indicated.

k	: 1,000 (Kilo)
M	: 1,000,000 (Mega)
Chip R	: Chip Resistor
Chip VR	: Chip Variable Resistor
Comp. R	: Composition Resistor
CR	: Carbon Film Resistor
FR	: Fusible Resistor
MFR	: Metal Film Resistor
MPR	: Metal Plate Resistor
OMR	: Oxide Metal Film Resistor
PMR	: Precision Metal Film Resistor
UFR	: Unflammable Resistor
VR	: Variable Resistor (Potentiometer)
WR	: Wire Wound Resistor

CAPACITORS—All capacitance values are in μF , unless otherwise indicated.

pF	: $\mu\mu\text{F}$ (Pico farad)
C Cap	: Ceramic Capacitor
Chip Cap	: Chip Capacitor
Chip T Cap	: Chip Tantalum Capacitor
E Cap	: Electrolytic Capacitor
FM Cap	: Film Mica Capacitor
LL Cap	: Low Leak Current Electrolytic Capacitor
MM Cap	: Metalized Mylar Capacitor
MP Cap	: Metalized Paper Capacitor
MY Cap	: Mylar Capacitor
NP Cap	: Non-polar Capacitor
PC Cap	: Polycarbonate Capacitor
PP Cap	: Polypropylene Capacitor
PS Cap	: Polystyrol Capacitor
T Cap	: Tantalum Capacitor
TF Cap	: Thin Film Capacitor
TR Cap	: Trimmer Capacitor

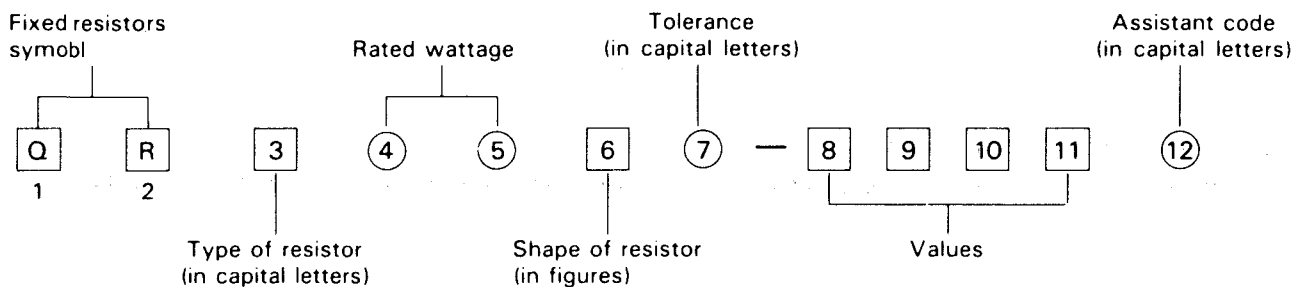
NOTES:

- [2 digits] indicates circuit board symbol number.
- "X " indicates quantity per set.

5.1 STANDARD PART NUMBER CODING

5.1.1 Fixed resistor coding

Fixed resistor part numbers are as follows.



Type of resistor (third digit)	Rated wattage (fourth and fifth digits)
C Composition resistors	A0 1/10 W
D Carbon film resistors	18 1/8 W
F Unflammable resistors	16 1/6 W
G Oxide metal film resistors	14 1/4 W
H Fusible resistors	12 1/2 W
M Metal plate resistors	01 1 W
S Metal glazed resistors	02 2 W
V Precision metal film resistors	03 3 W
W Wire wound resistors	04 4 W
X Metal film resistors	05 5 W
Z Special resistors	06 6 W
	07 7 W
	08 8 W
	10 10 W
	15 15 W
	A6 16 W
	20 20 W
	30 30 W

Tolerance (seventh digit)	Assistant code (twelfth digit)
F $\pm 1\%$	A Small type
G $\pm 2\%$	B Small type
J $\pm 5\%$	S Small type
K $\pm 10\%$	Y Lead tapping
M $\pm 20\%$	Z Lead tapping

Values (eighth — tenth or eleventh digits)

examples:

R47	.....	0.47 Ω
4R7	.....	4.7 Ω
470	.....	47×10^0 47 Ω
471	.....	47×10^1 470 Ω
472	.....	47×10^2 4.7 k Ω
473	.....	47×10^3 47 k Ω
474	.....	47×10^4 470 k Ω
475	.....	47×10^5 4.7 M Ω

QRV resistance shown by four digits:

4640	.....	464×10^0 464 Ω
4641	.....	464×10^1 4.64 k Ω
4642	.....	464×10^2 46.4 k Ω

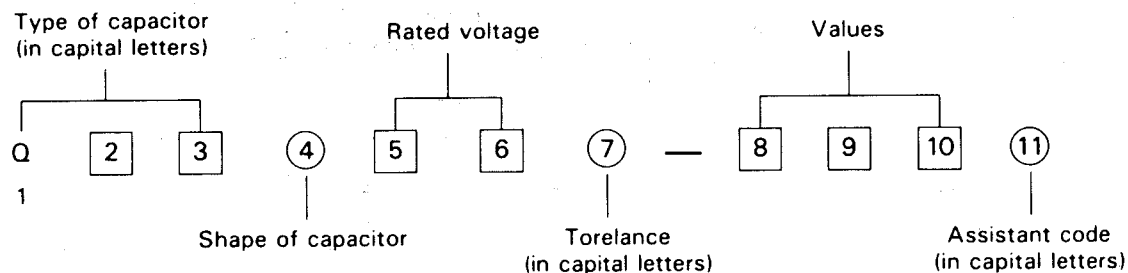
Shape of resistor (sixth digit)

Note:  indicates flame retardant resistor.

Type of resistor	C	D	F	G	H	M	S	V	W	X
1										
2										
3										
4										
5									(L) type	
6										
7			Lug (B) type							
8			Lug (A) type							
9			Lug (C) type							

5.1.2 Fixed capacitor coding

Fixed capacitor part numbers are as follows.



Ceramic capacitors

Type of capacitor (first – third digits)		Shape of capacitor (fourth digit)				
Symbol	Characteristics	Mono-direction	Kink lead	Axial lead	Axial forming lead	Chip
QCC	Ceramic	1		4	5	
QCD	High capacitance					A
QCF	High capacitance	1,4	3			8,A
QCS	Temperature compensation	1	3	4	5	8,A
QCT	Temperature compensation	Special coding				8,A
QCV	Ceramic			1	3	
QCX	Ceramic			1	3	
QCY	High capacitance	1,4	3	6	7	8,A
QCZ	Special type	Special coding				
QCB	Ceramic			B	C	

Electrolytic capacitors

Type of capacitor (first-third digits)		Shape of capacitor (fourth digit)				
Symbol	Characteristics	Tubular	Mono-direction	Anti-stress	Forming	Snap-in
QEB	Low leakage		4	5	6	
QEC	Low leakage		4,8,A	9,B	6,C	
QEE	Tantalum (normal)		4	5	6	
	Tantalum (small)		8			
QEF	Chip tantalum	8 (chip type)				
QEG	Low impedance		4			
QEK	Miniature type		4	5	6	
QEL	Small type		4	5	6	7
QEM	Small type		4,A	5	6	
QEN	Non-polar	2	4	5	6	
QEP	Non-polar (small)		4,A	5,B	6,C	
QER	Miniature type		4	5	6	
QET	Small type	2	4,A	5,B	6,C	7
QEU	Small type		4	5	6	
QEV	Small type		4		6	7
QEW	Normal	2	4	5	6	7

Paper film capacitors

Type of capacitor (first – third digits)		Shape of capacitor (fourth digit)				
		Tubular	Normal		Flame retardant	
Symbol	Characteristics		Mono-direction	Kink lead	Mono-direction	Kink lead
QFA	Metalized polypropylene				7	
QFE	Metalized mylar				5	
QFF	Film mica		4			
QFG	Polypropylene film		4	8		
QFH	Metalized mylar	2	4	3	5,7	6
QFJ	Mylar (special)		4			
QFK	Metalized mylar (small)				5	
QFM	Mylar	2	4	3,7	5	6
QFN	Mylar (small)		4	3		
QFP	Polypropylene		4	3,8		
QFS	Polystyrole	2	4	3		
QFV	Thin film		4	8		
QFZ	Special type	Special coding				

Rated voltage (fifth and sixth digits)

Sixth digit Fifth digit	A	B	C	D	E	F	G	H	J	K	V	W	X
0						3.15	4.0		6.3				
1	10		16	20	25		40	50	63	80	35		
2	100	125	160	200	250	315	400	500	630		350	450	600
3	1000	1250		2000				5000					

Tolerance (seventh digit)

A	+100 % -10 %	M	±20 %
F	±1 %	N	±30 %
G	±2 %	P	+100 % -0 %
H	+50 % -10 %	R	+30 % -10 %
J	±5 %	X	+40 % -20 %
K	±10 %	Z	+80 % -20 %

Values (eighth – tenth digits)

Example : Values are in picofarads

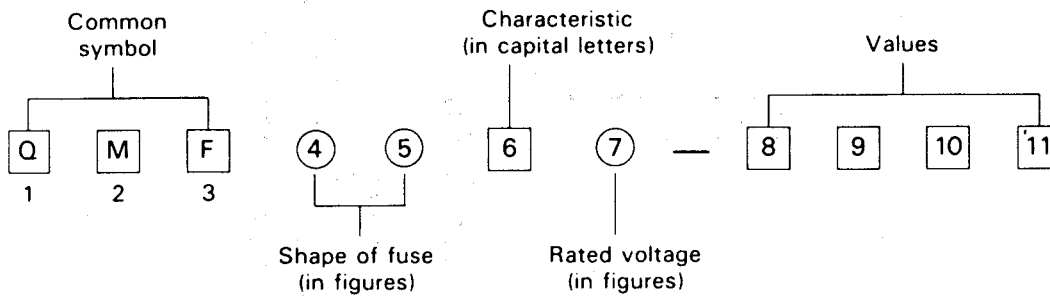
101	.....	10×10^1 pF	.....	100 pF
102	.....	10×10^2 pF	.....	1,000 pF (0.001 μ F)
103	.....	10×10^3 pF	.....	10,000 pF (0.01 μ F)
104	.....	10×10^4 pF	.....	100,000 pF (0.1 μ F)
105	.....	10×10^5 pF	.....	1 μ F
5R0	.....		.....	5.0 pF

Assistant code (eleventh digit)

G	Small size
Z	Lead tapping
Y	Lead tapping

5.1.3 Fuse coding

Standard fuse part numbers are as follows.



Shape of fuse (fourth and fifth digits)

51	φ5.2 × 20 mm
60	φ6.4 × 30 mm
61	φ6.35 × 31.8 mm
63	φ6.4 × 30 mm with lead wires
66	φ6.35 × 31.8 mm with lead wires
00	Special type

Rated voltage (seventh digit)

1	AC125 V
2	AC250 V
3	0.1 – 1 A : AC250 V 1.25 – 6.3 A : AC125 V

Values (eighth-tenth or eleventh digits)

example:

R63	.....	0.63 A
1R0	.....	1.0 A
2R5	.....	2.5 A
100	.....	10 A
R315	.....	0.315 A
1R25	.....	1.25 A

Characteristics (sixth digit)

Symbol	Fusing Current	Fusing Time	Remarks
A	210 %	Within 2 min.	Anti-rush type (for Europe)
	275 %	0.6 – 10 sec.	
	400 %	0.15 – 3 sec.	
	1000 %	0.02 – 0.3 sec.	
B	210 %	Within 30 min.	Regular fusible type (for SEMKO, Europe)
	275 %	0.05 – 2 sec.	
	400 %	0.01 – 0.3 sec.	
C	135 %	Within 1 hr.	Regular fusible type (for UL, Japan)
	200 %	Within 2 min.	
E	210 %	Within 2 min.	Anti-rush type (for Europe)
	275 %	0.6 – 10 sec.	
	400 %	0.15 – 3 sec.	
	1000 %	0.02 – 0.3 sec.	
J	135 %	Within 1 hr.	Anti-rush type
	200 %	Within 2 min.	
M	135 %	Within 1 hr.	Regular fusible type (for UL)
	200 %	Within 2 min.	
R	160 %	Within 1 hr.	Regular fusible type
	200 %	Within 2 min.	
S	160 %	Within 1 hr.	Anti-rush type
	200 %	Within 2 min.	
	700 % – 2000 %	Within 0.01 sec.	
U	135 %	Within 1 hr.	Anti-rush type (for UL)
	200 %	Within 2 min.	
	800 % – 2000 %	Within 0.01 sec.	

#	REF NO.	PART NO.	PART NAME, DESCRIPTION

* 6. SWITCHING POWER SUPPLY B.AY <01><02> *			

	PWBA	PB10078E-01	S.P.S.BOARD ASS'Y
Δ	POC1	QMP14B0-200	POWER CORD
Δ		OR QMP14B0-200E	POWER CORD
Δ	AO1	QMC0242-007	AC OUTLET
	BKT1	PQ20531-3	TRANS BRACKET
	CL1	PU55379	MINI CLAMP
Δ	HD1	QHS3771-108	STRAIN RELIEF
	HS2	PQ43230	HEAT SINK(2)
	SCW1	DPSP3010Z	SCREW,X2
	SCW2	SDST3006Z	SCREW,X3
	SCW3	DPSP4008Z	SCREW,X2
	SLD1	PQ32179	SHILD CASE(2)
	SLD2	PQ32180	SHILD CASE(3)
Δ	SLD3	PQ32075-2-2	COVER (1)
-SWITCHING POWER TRANSFORMER B.AY <01>-			
	PWBA1	PB10078E1-01	S.P.S.(1) BOARD ASS'Y
Δ	IC1	STR15006	IC
	Q1	DTD114ES	TRANSISTOR
	D1	10E4	DIODE
	D2	10E4	DIODE
	D3	10E4	DIODE
	D4	10E4	DIODE
	D5	RU1A	FR DIODE
	D6	AU01Z	FR DIODE
	D8	EK04	FR DIODE
	D9	RU1A	FR DIODE
	D10	FML-12S	FR DIODE
		OR F6P20F	FR DIODE
	D13	FMB-24	SBD
		OR F5KQ40B	SBD
	D15	MA165	DIODE
		OR 1SS133	DIODE
	R1	QRZ0078-1R0	WW RESISTOR
	R2	QRD181J-154	RESISTOR
	R3	QRD181J-154	RESISTOR
	R4	QRG029J-683	O.M.F RESISTOR
	R5	QRD181J-334	RESISTOR
	R6	QRG029J-181G	OMF RESISTOR
	R7	QRZ0078-R33	WW RESISTOR
Δ	R8	QRC122K-225E	RESISTOR
	R9	QRG029J-361A	OMF RESISTOR
	R100	QVZ3507-101	V RESISTOR,SEMIREG 15V ADJ
Δ	C1	QCZ9016-103P	CAPACITOR
Δ	C2	QFZ9025-333	M M CAP
Δ	C3	QCZ9016-222M	CAPACITOR
Δ	C4	QCZ9016-222M	CAPACITOR
Δ	C5	QCZ9016-102K	CAPACITOR
Δ	C10	QEZ0126-157	E CAPACITOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C11	QCY53AK-472	CAPACITOR
	C12	QCY43AK-121	CAPACITOR
	C13	QFL41HJ-222	M CAPACITOR
	C14	QFV41HJ-474	M CAPACITOR
	C15	QEZ0108-187Z	E CAPACITOR
Δ	C20	QEZ0125-338	E CAPACITOR
	C21	QETB1CM-108	E CAPACITOR
	C22	QETB1CM-108	E CAPACITOR
	C23	QEZ0106-478	E CAPACITOR
	C24	QETA1AM-108	E CAPACITOR
	C25	QFV41HJ-103	M CAPACITOR
Δ	L2	PU60401	LINE FILTER
	L10	PU56181-330	CHOKE COIL, 33 MICRO
	L11	PU56181-330	CHOKE COIL, 33 MICRO
	L12	PU59701-330	CHOKE COIL, 33 MICRO
Δ	PHC1	PC817	P.H.C.
Δ	RY1	PU59848	RELAY
Δ	T1	PU60402	SW. TRANS
Δ	HD1	PU57505	FUSE CLIP,X2
Δ	HS1	PQ32130-1-2	HEAT SINK
Δ	HS3	PQ43231	HEAT SINK(3)
Δ	SHT1	PU60477	SHEET
	SCW1	DPSP3008Z	ASSY SCREW
		DPSP3006Z	SCREW,X2
Δ	SCW2	DPSP2608Z	SCREW,X2
	SLD1	PQ32167	SHILD CASE(1)
Δ	SPC1	PQM30018-53	SPACER,X2
	CN1	PU60417-9	CAP HOUSING
	CN10	PU58844-2	CAP HOUSING
Δ	F1	QMF51J2-1R0N	FUSE,NOT INCL.S.P.S(1)PWB ASSY
Δ	F10	PU60479-4R0	MICRO FUSE
Δ	F11	PU60479-4R0	MICRO FUSE
-SWITCHING REGULATOR BOARD ASSY <02>-			
	PWBA2	PB10078E2-01	S.P.S.(2)BOARD ASS'Y
	Q10	2SD1764	TRANSISTOR
		OR 2SD1796	TRANSISTOR
	Q11	2SD1764	TRANSISTOR
		OR 2SD1796	TRANSISTOR
	Q12	2SC1740S(QRS)	TRANSISTOR
	Q13	2SD1764	TRANSISTOR
		OR 2SD1796	TRANSISTOR
	Q14	2SC1740S(QRS)	TRANSISTOR
	Q15	2SD1764	TRANSISTOR
		OR 2SD1796	TRANSISTOR
Δ	Q16	2SB1186(DE)	TRANSISTOR
	Q17	2SA720	TRANSISTOR
	Q18	DTB114ES	TRANSISTOR
	Q19	DTA114ES	TRANSISTOR
	Q20	DTA143XS	TRANSISTOR
	Q21	DTC143ES	TRANSISTOR
	Q22	2SA933S	TRANSISTOR
	D20	MTZ13C	ZENER DIODE
	D21	MTZ6.8B	ZENER DIODE
	D22	HZ4A3	ZENER DIODE

REF NO.	PART NO.	PART NAME, DESCRIPTION
D23	MA165	DIODE
OR	1SS133	DIODE
D24	11E2	DIODE
D25	11E2	DIODE
D26	11E2	DIODE
D27	11E2	DIODE
D28	MTZ15A	ZENER DIODE
D29	11E2	DIODE
D30	11E2	DIODE
D31	HZS33EB1	ZENER DIODE
D32	MTZ7.5C	ZENER DIODE
D33	MTZ20C	ZENER DIODE
D34	MA165	DIODE
OR	1SS133	DIODE
D35	1SS133	DIODE
D36	MA27TA	DIODE
R20	QRD161J-681	RESISTOR
R21	QRD161J-331	RESISTOR
R22	QRD161J-102	RESISTOR
R23	QRD161J-122	RESISTOR
R24	QRD161J-272	RESISTOR
R25	QRD161J-392	RESISTOR
R26	QRD161J-561	RESISTOR
R27	QRD161J-471	RESISTOR
R28	QRD161J-561	RESISTOR
R29	QVZ3521-331	V RESISTOR,+5V ADJ
R30	QRD161J-182	RESISTOR
R31	QRD161J-102	RESISTOR
R32	QRH127J-1R8	FUSIBLE RESISTOR
R33	QRD161J-392	RESISTOR
R34	QRD161J-153	RESISTOR
R35	QRZ0077-220X	FUSIBLE RESISTOR
R36	QRD161J-103	RESISTOR
R37	QRD161J-222	RESISTOR
R38	QRD181J-100	RESISTOR
R40	QRD161J-393	RESISTOR
R41	QRD161J-471	RESISTOR
R48	QRD161J-331	RESISTOR
R49	QRD161J-102	RESISTOR
R51	QRD162J-332	RESISTOR
C30	QETC1CM-476	E CAPACITOR
C32	QETC1CM-107	E CAPACITOR
C33	QFN31HJ-103	M CAPACITOR
C35	QETC1AM-107	E CAPACITOR
C36	QFN31HJ-103	M CAPACITOR
C38	QETB1EM-108	E CAPACITOR
C40	QETC1CM-107	E CAPACITOR
C41	QETC1JM-476	E CAPACITOR
C42	QETC1JM-476	E CAPACITOR
C43	QETC1HM-226	E CAPACITOR
C44	QETC1HM-226	E CAPACITOR
C45	QETC1HM-226	E CAPACITOR
C46	QETC1CM-107	E CAPACITOR
C47	QETC1HM-106	E CAPACITOR
C48	QEK61CM-106	E CAPACITOR
T2	PU60455	POWER TRANSFORMER
CN3	PU60417-6	CAP HOUSING
CN4	PU58844-2	CAP HOUSING
CN5	PU58844-2	CAP HOUSING
CN6	PU58844-3	CAP HOUSING
CN7	PU58844-2	CAP HOUSING
CN8	PU60417-8	CAP HOUSING
CN9	PU58844-3	CAP HOUSING

REF NO.	PART NO.	PART NAME, DESCRIPTION
CN11	PU58844-2	CAP HOUSING
CN12	PU58844-2	CAP HOUSING
CN13	PU58844-4	CAP HOUSING
CP3	ICP-F20	CIRCUIT PROTECTOR

* 7. MAIN BOARD ASSEMBLY <03> *		

PWBA	PB10057E-02	MAIN BOARD ASSY
HN1	PU58018-1-2	PWB HINGE, X2
RV1	PU52105	PLASTIC RIVET
SLD1	PQ43396-1-1	VIDEO SHIELD
SPC1	PQM30029-10	SPACER
SPC2	PQM30029-28	SPACER
-VIDEO SECTION-		
TP	PU57545	TEST PIN, X6
IC1	PB20166D	Y MODULE
IC2	PB20187C	Y.MODULE
IC3	M51647SP	IC
IC4	MN3801	IC
IC5	MN3801	IC
IC6	MN3106	IC
IC8	UPC319C	IC
IC10	BU4030B	IC
IC11	AN3211NK	IC
IC12	BA7021	IC
IC13	LA7220	IC
IC14	LA7220	IC
IC15	LA7220	IC
IC16	LA7220	IC
IC17	LA7220	IC
IC18	BU4013B	IC
IC301	PU22517D	C.MODULE
IC302	BA7233	IC
Q1	2SC3354(TS)	TRANSISTOR
Q2	2SC1740S(S)	TRANSISTOR
Q3	2SC1740S(QRS)	TRANSISTOR
Q4	2SA933S(RS)	TRANSISTOR
Q5	2SC1740S(QRS)	TRANSISTOR
Q6	2SC1740S(S)	TRANSISTOR
Q7	2SC1740S(S)	TRANSISTOR
Q8	2SC3354(TS)	TRANSISTOR
Q9	DTC144ES	TRANSISTOR
Q10	DTC144ES	TRANSISTOR
Q11	2SC1740S(QRS)	TRANSISTOR
Q12	2SC1740S(QRS)	TRANSISTOR
Q13	2SC1740S(QRS)	TRANSISTOR
Q14	DTC144ES	TRANSISTOR
Q15	DTC144ES	TRANSISTOR
Q17	2SC3354	TRANSISTOR
Q18	DTA114TS	TRANSISTOR
Q19	2SC1740S(QRS)	TRANSISTOR
Q20	2SA933S(RS)	TRANSISTOR
Q21	DTC144ES	TRANSISTOR
Q22	2SC1740S(QRS)	TRANSISTOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
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Q23	2SC1740S(QRS)	TRANSISTOR
Q24	2SC1740S(QRS)	TRANSISTOR
Q25	2SA933S(RS)	TRANSISTOR
Q26	2SC1740S(QRS)	TRANSISTOR
Q27	DTA124ES	TRANSISTOR
Q30	2SC1740S(QRS)	TRANSISTOR
Q31	2SC1740S(QRS)	TRANSISTOR
Q32	DTA124ES	TRANSISTOR
Q33	2SA933S(RS)	TRANSISTOR
Q34	DTC144ES	TRANSISTOR
Q35	DTC144ES	TRANSISTOR
Q37	DTA124ES	TRANSISTOR
Q38	DTA124ES	TRANSISTOR
Q39	DTA124ES	TRANSISTOR
Q40	DTA124ES	TRANSISTOR
Q41	DTA124ES	TRANSISTOR
Q42	2SC1740S(QRS)	TRANSISTOR
Q43	2SA933S(RS)	TRANSISTOR
Q44	DTA124ES	TRANSISTOR
Q45	2SA854S(R)	TRANSISTOR
Q46	DTA124ES	TRANSISTOR
Q47	2SA854S(R)	TRANSISTOR
Q48	DTA124ES	TRANSISTOR
Q49	2SA854S(R)	TRANSISTOR
Q50	2SA854S(R)	TRANSISTOR
Q51	2SA854S(R)	TRANSISTOR
Q52	2SA933S(RS)	TRANSISTOR
Q53	2SA933S(RS)	TRANSISTOR
Q54	DTC144ES	TRANSISTOR
Q56	2SC1740S(S)	TRANSISTOR
Q57	2SC1740S(QRS)	TRANSISTOR
Q58	2SA933S(RS)	TRANSISTOR
Q59	2SA933S(RS)	TRANSISTOR
Q60	DTC144ES	TRANSISTOR
Q61	DTA124ES	TRANSISTOR
Q62	DTC144ES	TRANSISTOR
Q64	2SA933S(RS)	TRANSISTOR
Q65	2SC1740S(QRS)	TRANSISTOR
Q66	DTA124ES	TRANSISTOR
Q69	2SA933S(RS)	TRANSISTOR
Q70	DTC144ES	TRANSISTOR
Q71	2SA933S(RS)	TRANSISTOR
Q72	DTA124ES	TRANSISTOR
Q73	DTA124ES	TRANSISTOR
Q301	DTC144ES	TRANSISTOR
Q302	2SC1740S(QRS)	TRANSISTOR
Q303	2SC3354	TRANSISTOR
Q304	DTC144WS	TRANSISTOR
Q305	2SC3354(TS)	TRANSISTOR
Q306	2SC1740S(QRS)	TRANSISTOR
Q307	DTC144ES	TRANSISTOR
Q308	2SC1740S(QRS)	TRANSISTOR
Q309	2SC1740S(QRS)	TRANSISTOR
Q311	2SC1740S(QRS)	TRANSISTOR
Q312	DTA124ES	TRANSISTOR
D1	1SS133	DIODE
D2	1SS133	DIODE
D3	1SS133	DIODE
D4	0A90	DIODE
D5	0A90	DIODE
D6	1SS133	DIODE
D7	1SS133	DIODE
D8	1SS99	DIODE
D9	1SS99	DIODE
D10	1SS99	DIODE

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
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D11	1SS99	DIODE
D12	MA27W(B)	DIODE
D13	1SS133	DIODE
D14	1SS133	DIODE
D15	1SS133	DIODE
D16	DAP209S	DIODE
D19	1SS133	DIODE
D20	1SS133	DIODE
D21	1SS133	DIODE
D22	1SS133	DIODE
D23	1SS133	DIODE
D25	1SS133	DIODE
D26	1SS133	DIODE
D27	1SS133	DIODE
D28	1SS133	DIODE
D29	1SS133	DIODE
D31	1SS133	DIODE
D32	1SS133	DIODE
D33	1SS133	DIODE
D34	1SS133	DIODE
D35	1SS133	DIODE
D36	1SS133	DIODE
D37	1SS133	DIODE
D38	1SS133	DIODE
D39	1SS133	DIODE
D40	1SS133	DIODE
D41	1SS133	DIODE
D42	1SS133	DIODE
D43	1SS133	DIODE
D44	1SS133	DIODE
D45	1SS133	DIODE
D46	1SS133	DIODE
D47	1SS133	DIODE
D48	1SS133	DIODE
D49	1SS133	DIODE
D50	1SS133	DIODE
D51	1SS133	DIODE
D52	1SS133	DIODE
D53	1SS133	DIODE
D54	1SS133	DIODE
D55	1SS133	DIODE
D60	1SS133	DIODE
D61	1SS133	DIODE
D62	1SS133	DIODE
D64	1SS133	DIODE
D66	1SS133	DIODE
D67	1SS133	DIODE
D68	1SS133	DIODE
D70	1SS133	DIODE
D71	1SS133	DIODE
D72	1SS133	DIODE
D73	1SS133	DIODE
D76	1SS133	DIODE
D77	1SS133	DIODE
D79	1SS133	DIODE
D80	1SS133	DIODE
D81	1SS133	DIODE
D83	1SS133	DIODE
D85	1SS133	DIODE
D88	1SS133	DIODE
D89	1SS133	DIODE
D91	1SS133	DIODE
D92	1SS133	DIODE
D93	1SS133	DIODE
D95	1SS133	DIODE
D96	1SS133	DIODE

REF NO.	PART NO.	PART NAME, DESCRIPTION
D97	1SS133	DIODE
D100	1SS133	DIODE
D101	1SS133	DIODE
D102	1SS133	DIODE
D301	1SS133	DIODE
D302	1SS133	DIODE
D303	1SS133	DIODE
D304	1SS133	DIODE
D305	1SS133	DIODE
R1	QRD161J-123	RESISTOR
R2	QRD161J-123	RESISTOR
R3	QVZ3518-103	V RESISTOR, CCD BIAS 1
R4	QRD161J-123	RESISTOR
R5	QRD161J-223	RESISTOR
R6	QRD161J-103	RESISTOR
R7	QRD161J-103	RESISTOR
R8	QRD161J-333	RESISTOR
R9	QRD161J-102	RESISTOR
R10	QRD161J-102	RESISTOR
R11	QRD161J-393	RESISTOR
R12	QRD161J-561	RESISTOR
R13	QRD161J-102	RESISTOR
R14	QRD161J-102	RESISTOR
R15	QRD161J-102	RESISTOR
R16	QRD161J-472	RESISTOR
R17	QRD161J-222	RESISTOR
R18	QRD161J-562	RESISTOR
R19	QRD161J-103	RESISTOR
R20	QVZ3518-103	V RESISTOR, CCD BIAS 2
R21	QRD161J-123	RESISTOR
R22	QRD161J-225	RESISTOR
R23	QRD161J-103	RESISTOR
R24	QRD161J-103	RESISTOR
R25	QRD161J-102	RESISTOR
R26	QRD161J-222	RESISTOR
R27	QRD161J-182	RESISTOR
R28	QVZ3518-102	V RESISTOR, YNR NC BALANCE
R29	QRD161J-223	RESISTOR
R30	QRD161J-184	RESISTOR
R31	QRD161J-271	RESISTOR
R32	QRD161J-121	RESISTOR
R33	QRD161J-471	RESISTOR
R34	QRD161J-122	RESISTOR
R35	QRD161J-471	RESISTOR
R36	QRD161J-222	RESISTOR
R37	QRD161J-472	RESISTOR
R38	QRD161J-103	RESISTOR
R39	QRD161J-682	RESISTOR
R40	QVZ3518-471	V RESISTOR, COLOR COMB ADJ
R41	QRD161J-391	RESISTOR
R42	QRD161J-821	RESISTOR
R43	QRD161J-152	RESISTOR
R44	QRD161J-471	RESISTOR
R45	QVZ3518-102	V RESISTOR, Y COMB ADJ
R46	QRD161J-561	RESISTOR
R47	ERS-A39J-561T	THERMISTOR
R48	QVZ3518-681	V RESISTOR, Y COMB ADJ
R49	QRD161J-102	RESISTOR
R50	QRD161J-272	RESISTOR
R51	QRD161J-153	RESISTOR
R52	QRD161J-273	RESISTOR
R59	QRD161J-182	RESISTOR
R60	QRD161J-473	RESISTOR
R65	QRD161J-123	RESISTOR
R66	QRD161J-822	RESISTOR

REF NO.	PART NO.	PART NAME, DESCRIPTION
R67	QRD161J-104	RESISTOR
R68	QRD161J-103	RESISTOR
R69	QRD161J-474	RESISTOR
R71	QVZ3518-151	V RESISTOR, PROCES INPUT LEV
R72	QRD161J-241	RESISTOR
R73	QRD161J-391	RESISTOR
R74	QRD161J-471	RESISTOR
R75	QRD161J-332	RESISTOR
R76	QRD161J-332	RESISTOR
R77	QRD161J-471	RESISTOR
R79	QRD161J-821	RESISTOR
R80	QRD161J-103	RESISTOR
R82	QRD161J-222	RESISTOR
R83	QRD161J-102	RESISTOR
R84	QRD161J-102	RESISTOR
R85	QRD161J-752	RESISTOR
R86	QRD161J-561	RESISTOR
R87	QRD161J-102	RESISTOR
R88	QRD161J-223	RESISTOR
R89	QRD161J-332	RESISTOR
R90	QRD161J-431	RESISTOR
R92	QRD161J-102	RESISTOR
R93	QRD161J-122	RESISTOR
R94	QRD161J-472	RESISTOR
R95	QRD161J-102	RESISTOR
R96	QRD161J-472	RESISTOR
R97	QRD161J-103	RESISTOR
R98	QRD161J-391	RESISTOR
R99	QRD161J-332	RESISTOR
R100	QRD161J-241	RESISTOR
R101	QRD161J-392	RESISTOR
R102	QRD161J-470	RESISTOR
R103	QRD161J-102	RESISTOR
R104	QRD161J-122	RESISTOR
R105	QRD161J-102	RESISTOR
R106	QRD161J-471	RESISTOR
R107	QRD161J-821	RESISTOR
R108	QRD161J-821	RESISTOR
R109	QVZ3518-102	V RESISTOR, REC FM LEV(N-MODE)
R110	QRD161J-103	RESISTOR
R111	QRD161J-223	RESISTOR
R113	QRD161J-391	RESISTOR
R114	QRD161J-681	RESISTOR
R115	QRD161J-391	RESISTOR
R116	QVZ3518-102	V RESISTOR, REC FM LEV(S-MODE)
R117	QRD161J-223	RESISTOR
R118	QRD161J-153	RESISTOR
R119	QRD161J-681	RESISTOR
R120	QRD161J-102	RESISTOR
R121	QRD161J-102	RESISTOR
R122	QRD161J-124	RESISTOR
R123	QRD161J-822	RESISTOR
R125	QRD161J-102	RESISTOR
R126	QVZ3518-473	V RESISTOR, PB Y LEV(S-MODE)
R127	QRD161J-223	RESISTOR
R131	QVZ3518-333	V RESISTOR, PB Y LEV(N-MODE)
R132	QRD161J-103	RESISTOR
R133	QRD161J-222	RESISTOR
R134	QRD161J-102	RESISTOR
R135	QRD161J-272	RESISTOR
R137	QRD161J-681	RESISTOR
R138	QRD161J-392	RESISTOR
R139	QRD161J-104	RESISTOR
R140	QRD161J-103	RESISTOR
R141	QRD161J-562	RESISTOR
R142	QRD161J-103	RESISTOR

# REF NO. PART NO. PART NAME, DESCRIPTION	# REF NO. PART NO. PART NAME, DESCRIPTION
R143 QRD161J-152 RESISTOR	R227 QRD161J-562 RESISTOR
R145 QRD161J-104 RESISTOR	R228 QRD161J-182 RESISTOR
R146 QRD161J-104 RESISTOR	R229 QRD161J-152 RESISTOR
R147 QRD161J-103 RESISTOR	R230 QRD161J-125 RESISTOR
R149 QRD161J-272 RESISTOR	
R150 QRD161J-393 RESISTOR	
	R231 QRD161J-102 RESISTOR
R151 QRD161J-393 RESISTOR	R232 QRD161J-102 RESISTOR
R152 QRD161J-272 RESISTOR	R233 QRD161J-102 RESISTOR
R153 QRD161J-273 RESISTOR	R234 QRD161J-333 RESISTOR
R154 QRD161J-822 RESISTOR	R235 QRD161J-152 RESISTOR
R155 QRD161J-222 RESISTOR	R236 QRD161J-185 RESISTOR
R156 QRD161J-472 RESISTOR	R237 QRD161J-273 RESISTOR
R158 QRD123J-391 RESISTOR	R240 QRD161J-103 RESISTOR
R159 QRD123J-391 RESISTOR	
R160 QRD123J-391 RESISTOR	R241 QRD161J-102 RESISTOR
	R242 QRD161J-105 RESISTOR
R161 QRD161J-750 RESISTOR	R243 QRD161J-105 RESISTOR
R162 QRD161J-750 RESISTOR	R244 QRD161J-104 RESISTOR
R163 QRD161J-750 RESISTOR	R246 QRD161J-223 RESISTOR
R164 QRD161J-102 RESISTOR	R247 QRD161J-273 RESISTOR
R165 QRD161J-102 RESISTOR	R248 PU52108-2R2 POSISTOR
R166 QRD161J-102 RESISTOR	OR PU52108-2R2T POSISTOR
R167 QRD161J-393 RESISTOR	R249 QRD161J-392 RESISTOR
R168 QRD161J-472 RESISTOR	
R169 QRD161J-103 RESISTOR	R251 QRD161J-184 RESISTOR
R170 QRD161J-102 RESISTOR	R252 QRD161J-560 RESISTOR
R171 QRD161J-102 RESISTOR	R301 QRD161J-102 RESISTOR
R172 QRD161J-102 RESISTOR	R302 QRD161J-332 RESISTOR
R173 QRD161J-102 RESISTOR	R303 QRD161J-152 RESISTOR
R174 QRD161J-473 RESISTOR	R304 QRD161J-103 RESISTOR
R175 QRD161J-472 RESISTOR	R305 QRD161J-222 RESISTOR
R176 QRD161J-103 RESISTOR	R306 QRD161J-102 RESISTOR
R177 QRD161J-473 RESISTOR	R307 QRD161J-152 RESISTOR
R178 QRD161J-473 RESISTOR	R308 QRD161J-102 RESISTOR
R180 QRD162J-103 RESISTOR	R309 QRD161J-102 RESISTOR
	R310 QRD161J-102 RESISTOR
R182 QRD161J-471 RESISTOR	R311 QRD161J-182 RESISTOR
R183 QRD161J-331 RESISTOR	R312 QRD161J-102 RESISTOR
R184 QRD161J-222 RESISTOR	R313 QVZ3518-471 V RESISTOR, SP COLOR LEVEL
R185 QRD161J-393 RESISTOR	R314 QVZ3518-471 V RESISTOR, EP COLOR LEVEL
R186 QRD161J-103 RESISTOR	R315 QRD161J-103 RESISTOR
R190 QRD161J-472 RESISTOR	R316 QRD161J-682 RESISTOR
	R317 QRD161J-123 RESISTOR
R193 QRD161J-473 RESISTOR	R318 QRD161J-332 RESISTOR
R194 QRD161J-393 RESISTOR	R319 QRD161J-273 RESISTOR
R196 QRD161J-102 RESISTOR	R320 QRD161J-102 RESISTOR
R197 QRD161J-102 RESISTOR	
R198 QRD161J-332 RESISTOR	R321 QVZ3518-471 V RESISTOR, CNR FB
R199 QRD161J-152 RESISTOR	R322 QRD161J-101 RESISTOR
R200 QRD161J-152 RESISTOR	R323 QVZ3518-472 V RESISTOR, CNR NC BAL
	R324 QRD161J-561 RESISTOR
R201 QRD161J-152 RESISTOR	R325 QRD161J-561 RESISTOR
R202 QRD161J-153 RESISTOR	R326 QRD161J-223 RESISTOR
R203 QRD161J-393 RESISTOR	R328 QVZ3518-222 V RESISTOR, CNR INPUT LEVEL
R204 QVZ3518-103 V RESISTOR, E-E LEVEL	R329 QRD161J-102 RESISTOR
R205 QRD161J-332 RESISTOR	R330 QRD161J-562 RESISTOR
R206 QRD161J-393 RESISTOR	
R207 QRD161J-101 RESISTOR	
	R331 QRD161J-473 RESISTOR
R214 QRD161J-272 RESISTOR	R332 QRD161J-473 RESISTOR
R215 QRD161J-272 RESISTOR	R333 QRD161J-123 RESISTOR
R216 QRD161J-105 RESISTOR	R334 QRD161J-222 RESISTOR
R217 QRD161J-272 RESISTOR	R335 QRD161J-152 RESISTOR
R218 QRD161J-103 RESISTOR	R336 QRD161J-472 RESISTOR
R220 QRD161J-475 RESISTOR	R337 QRD161J-561 RESISTOR
	R338 QRD161J-471 RESISTOR
R221 QRD161J-103 RESISTOR	R339 QRD161J-472 RESISTOR
R222 QRD161J-152 RESISTOR	
R223 QRD161J-272 RESISTOR	C2 QEK60JM-476 E CAPACITOR
R224 QRD161J-152 RESISTOR	C3 QCVB1CN-103 CAPACITOR
R225 QRD161J-331 RESISTOR	C4 QCSB1HJ-100 CAPACITOR
R226 QRD161J-333 RESISTOR	C5 QCSB1HJ-100 CAPACITOR
	C6 QCVB1CN-103 CAPACITOR

REF NO.	PART NO.	PART NAME, DESCRIPTION	REF NO.	PART NO.	PART NAME, DESCRIPTION
C7	QEK61HM-105	E CAPACITOR	C75	QCF31HP-223	CAPACITOR
C8	QCVB1CN-103	CAPACITOR	C76	QCB81HJ-151	CAPACITOR
C9	QCVB1CN-103	CAPACITOR	C77	QCB81HJ-102	CAPACITOR
C10	QCVB1CN-103	CAPACITOR	C78	QCB81HJ-102	CAPACITOR
			C79	QCVB1CN-103	CAPACITOR
C11	QCVB1CN-103	CAPACITOR	C80	QETC1CM-476	E CAPACITOR
C12	QEK61EM-475	E CAPACITOR			
C13	QCB81HJ-151	CAPACITOR	C81	QCB81HJ-151	CAPACITOR
C14	QCVB1CN-103	CAPACITOR	C82	QCB81HJ-151	CAPACITOR
C16	QCC31CJ-472	CAPACITOR	C83	QCVB1CN-103	CAPACITOR
C17	QEK61HM-225	E CAPACITOR	C84	QCVB1CN-103	CAPACITOR
C18	QCVB1CN-103	CAPACITOR	C85	QCVB1CN-103	CAPACITOR
C20	QEK60JM-476	E CAPACITOR	C86	QCSB1HJ-120	CAPACITOR
			C87	QCSB1HJ-270	CAPACITOR
C21	QCVB1CN-103	CAPACITOR	C88	QETC1EM-475	E CAPACITOR
C22	QEK61EM-475	E CAPACITOR	C89	QCVB1CN-103	CAPACITOR
C25	QEK60JM-476	E CAPACITOR	C90	QCVB1CN-103	CAPACITOR
C26	QCVB1CN-103	CAPACITOR			
C27	QCVB1CN-103	CAPACITOR	C91	QETC1HM-224	E CAPACITOR
C28	QCSB1HJ-100	CAPACITOR	C92	QEK60JM-476	E CAPACITOR
C29	QEK61HM-105	E CAPACITOR	C93	QCVB1CN-103	CAPACITOR
C30	QCVB1CN-103	CAPACITOR	C94	QETC0JM-337	E CAPACITOR
			C95	QCSB1HJ-120	CAPACITOR
C31	QCVB1CN-103	CAPACITOR	C96	QCVB1CN-103	CAPACITOR
C32	QCVB1CN-103	CAPACITOR	C97	QCB81HJ-820	CAPACITOR
C33	QCVB1CN-103	CAPACITOR	C98	QCVB1CN-103	CAPACITOR
C34	QETC1CM-106	E CAPACITOR	C99	QCSB1HJ-220	CAPACITOR
C35	QEK61CM-476	E CAPACITOR	C100	QETC1AM-226	E CAPACITOR
C36	QEK61HM-334	E CAPACITOR			
C37	QEK60JM-476	E CAPACITOR	C101	QETC1HM-105	E CAPACITOR
C38	QCVB1CN-103	CAPACITOR	C102	QETC1HM-225	E CAPACITOR
C39	QCT25RH-200	CAPACITOR	C103	QETC1HM-105	E CAPACITOR
	OR QCT05RH-200	CAPACITOR	C106	QCB81HJ-181	CAPACITOR
C40	QCT05TH-470	CAPACITOR	C107	QCVB1CN-103	CAPACITOR
	OR QCT25TH-470	CAPACITOR	C108	QCVB1CN-103	CAPACITOR
			C109	QEK61EM-475	E CAPACITOR
C41	QCT05TH-390	CAPACITOR	C110	QETC1HM-474	E CAPACITOR
	OR QCT25TH-390	CAPACITOR			
C42	QCVB1CN-103	CAPACITOR	C111	QETC1EM-335	E CAPACITOR
C43	QCT25RH-390	CAPACITOR	C112	QCVB1CN-103	CAPACITOR
	OR QCT05RH-390	CAPACITOR	C113	QETC0JM-107	E CAPACITOR
C44	QETC1CM-227	E CAPACITOR	C116	QCVB1CN-103	CAPACITOR
C45	QCVB1CN-103	CAPACITOR	C118	QETC1EM-335	E CAPACITOR
C46	QCVB1CN-103	CAPACITOR	C119	QETC1EM-475	E CAPACITOR
C47	QETC1CM-476	E CAPACITOR	C120	QETA0JM-477	E CAPACITOR
C48	QCVB1CN-103	CAPACITOR			
C49	QETC1CM-106	E CAPACITOR	C121	QETC0JM-477	E CAPACITOR
C50	QCVB1CN-103	CAPACITOR	C122	QCVB1CN-103	CAPACITOR
			C123	QCVB1CN-103	CAPACITOR
C51	QCVB1CN-103	CAPACITOR	C124	QETC1CM-476	E CAPACITOR
C52	QETC1CM-476	E CAPACITOR	C125	QCVB1CN-103	CAPACITOR
C53	QCVB1CN-103	CAPACITOR	C126	QETC1CM-476	E CAPACITOR
C55	QCVB1CN-103	CAPACITOR	C127	QCSB1HJ-150	CAPACITOR
C56	QETC0JM-476	E CAPACITOR	C129	QETA0JM-336	E CAPACITOR
C57	QETC1CM-106	E CAPACITOR	C130	QCVB1CN-103	CAPACITOR
C58	QETC0JM-476	E CAPACITOR			
C59	QETC1EM-475	E CAPACITOR	C131	QETC1EM-475	E CAPACITOR
C60	QETC1EM-475	E CAPACITOR	C132	QETC1EM-475	E CAPACITOR
			C133	QETC1EM-475	E CAPACITOR
C61	QETC1EM-475	E CAPACITOR	C134	QETC1CM-106	E CAPACITOR
C62	QETC1AM-336	E CAPACITOR	C135	QETC1EM-475	E CAPACITOR
C63	QCSB1HJ-390	CAPACITOR	C136	QEN61EM-335	NP E CAPACITOR
C64	QCVB1CN-103	CAPACITOR	C137	QCVB1CN-103	CAPACITOR
C65	QCSB1HJ-180	CAPACITOR	C138	QCVB1CN-103	CAPACITOR
C66	QETC1CM-226	E CAPACITOR	C139	QCVB1CN-103	CAPACITOR
C67	QETC1CM-106	E CAPACITOR	C140	QCVB1CN-103	CAPACITOR
C68	QCXB1CM-222	CAPACITOR			
C69	QCB81HJ-221	CAPACITOR	C141	QCVB1CN-103	CAPACITOR
C70	QCB81HJ-151	CAPACITOR	C142	QETA0JM-337	E CAPACITOR
			C143	QCVB1CN-103	CAPACITOR
C71	QCB81HJ-102	CAPACITOR	C144	QCVB1CN-103	CAPACITOR
C72	QCSB1HJ-330	CAPACITOR	C145	QCVB1CN-103	CAPACITOR
C73	QCB81HJ-101	CAPACITOR	C146	QCB81HJ-101	CAPACITOR
C74	QCB81HJ-102	CAPACITOR	C147	QCVB1CN-103	CAPACITOR

# REF NO.	PART NO.	PART NAME, DESCRIPTION	# REF NO.	PART NO.	PART NAME, DESCRIPTION
C149	QCVB1CN-103	CAPACITOR	C223	QCB81HJ-102	CAPACITOR
C151	QCVB1CN-103	CAPACITOR	C224	QCSB1HJ-100	CAPACITOR
C152	QETC1CM-106	E CAPACITOR	C225	QCB81HJ-181	CAPACITOR
C153	QETC1AM-336	E CAPACITOR	C226	QCB81HJ-102	CAPACITOR
C154	QETA1CM-106	E CAPACITOR	C227	QCB81HJ-102	CAPACITOR
C156	QETC1CM-106	E CAPACITOR	C228	QCT05CH-221	CAPACITOR
C157	QETA1AM-336	E CAPACITOR	C229	QEK41CM-226	E CAPACITOR
C158	QETC1EM-475	E CAPACITOR	C231	QCSB1HJ-220	CAPACITOR
C160	QETC1CM-106	E CAPACITOR	C234	QCB81HJ-561	CAPACITOR
C161	QCVB1CN-103	CAPACITOR	C301	QETC0JM-337	E CAPACITOR
C162	QCSB1HJ-560	CAPACITOR	C302	QETC1EM-475	E CAPACITOR
C163	QCVB1CN-103	CAPACITOR	C303	QETC1HM-224	E CAPACITOR
C164	QCVB1CN-103	CAPACITOR	C304	QEN61HM-474	NP E CAPACITOR
C165	QCVB1CN-103	CAPACITOR	C305	QETC1HM-104	E CAPACITOR
C166	QCVB1CN-103	CAPACITOR	C306	QCVB1CN-103	CAPACITOR
C167	QETC1AM-476	E CAPACITOR	C307	QCVB1CN-103	CAPACITOR
C168	QETC1CM-106	E CAPACITOR	C308	QCB81HJ-820	CAPACITOR
C169	QETC1CM-106	E CAPACITOR	C309	QETC0JM-337	E CAPACITOR
C170	QETC1CM-106	E CAPACITOR	C310	QETC1EM-335	E CAPACITOR
C171	QETC1CM-106	E CAPACITOR	C312	QCVB1CN-103	CAPACITOR
C172	QCVB1CN-103	CAPACITOR	C313	QETC1HM-474	E CAPACITOR
C173	QETC1HM-224	E CAPACITOR	C314	QCVB1CN-103	CAPACITOR
C174	QCVB1CN-103	CAPACITOR	C315	QCVB1CN-103	CAPACITOR
C175	QETC0JM-107	E CAPACITOR	C316	QCSB1HJ-560	CAPACITOR
C176	QETC1HM-225	E CAPACITOR	C317	QCSB1HJ-270	CAPACITOR
C177	QETC1EM-475	E CAPACITOR	C318	QCC31CJ-473	CAPACITOR
C178	QETC1EM-475	E CAPACITOR	C319	QCVB1CN-103	CAPACITOR
C179	QETA1AM-226	E CAPACITOR	C320	QCVB1CN-103	CAPACITOR
OR	QEK41AM-226	E CAPACITOR	C321	QCVB1CN-103	CAPACITOR
C180	QCSB1CM-222	CAPACITOR	C322	QCT25CH-101	CAPACITOR
C181	QEK60JM-476	E CAPACITOR	C323	QCVB1CN-103	CAPACITOR
C182	QCVB1CN-103	CAPACITOR	C324	QCVB1CN-103	CAPACITOR
C183	QEN61HM-105	NP E CAPACITOR	C325	QCVB1CN-103	CAPACITOR
C184	QETC1HM-105	E CAPACITOR	C326	QCVB1CN-103	CAPACITOR
C185	QETC1HM-105	E CAPACITOR	C327	QETC1HM-105	E CAPACITOR
C186	QCVB1CN-103	CAPACITOR	C330	QETC0JM-476	E CAPACITOR
C189	QETC0JM-107	E CAPACITOR	C331	QETC0JM-476	E CAPACITOR
C190	QEN61HM-105	NP E CAPACITOR	C332	QCVB1CN-103	CAPACITOR
C193	QCVB1CN-103	CAPACITOR	C333	QCVB1CN-103	CAPACITOR
C194	QCVB1CN-103	CAPACITOR	C334	QCVB1CN-103	CAPACITOR
C195	QFN41HJ-223	M CAPACITOR	C335	QCB81HJ-121	CAPACITOR
C196	QCVB1CN-103	CAPACITOR	C337	QCB81HJ-331	CAPACITOR
C197	QCB81HJ-102	CAPACITOR	C338	QCVB1CN-103	CAPACITOR
C198	QCSB1HJ-470	CAPACITOR	C339	QER61CM-106	E CAPACITOR
C199	QCS31HJ-120	CAPACITOR	C341	QFN31HJ-562	M CAPACITOR
C201	QCSB1HJ-270	CAPACITOR	C342	QCVB1CN-103	CAPACITOR
C203	QCVB1CN-103	CAPACITOR	C343	QCS31HJ-6R0	CAPACITOR
C204	QCSB1HJ-150	CAPACITOR	C344	QCSB1HJ-150	CAPACITOR
C205	QCB81HJ-151	CAPACITOR	C345	QCVB1CN-103	CAPACITOR
C206	QCB81HJ-101	CAPACITOR	C346	QCVB1CN-103	CAPACITOR
C207	QCB81HJ-820	CAPACITOR	C347	QCSB1HJ-150	CAPACITOR
C208	QEK61AM-226	E CAPACITOR	L1	PU48530-101K	PEAKING COIL, 100 MICRO
C209	QCB81HJ-102	CAPACITOR	L2	PU48530-1R2K	PEAKING COIL, 1.2 MICRO
C210	QCB81HJ-102	CAPACITOR	L3	PU48530-101K	PEAKING COIL, 100 MICRO
C211	QCB81HJ-102	CAPACITOR	L5	PU59152-101J	PEAKING COIL, 100 MICRO
C212	QCB81HJ-102	CAPACITOR	L6	PU59152-270J	PEAKING COIL, 27 MICRO
C213	QCB81HJ-102	CAPACITOR	L7	PU48530-101K	PEAKING COIL, 100 MICRO
C215	QCVB1CN-103	CAPACITOR	L8	PU54223-101J	PEAKING COIL, 100 MICRO
C216	QCVB1CN-103	CAPACITOR	L9	PU59152-101J	PEAKING COIL, 100 MICRO
C217	QCT05CH-101	CAPACITOR	L10	PU59152-470J	PEAKING COIL, 47 MICRO
OR	QCT25CH-101	CAPACITOR	L11	PU48530-101K	PEAKING COIL, 100 MICRO
C218	QCSB1HJ-330	CAPACITOR	L12	PU59152-470J	PEAKING COIL, 47 MICRO
C219	QCSB1HJ-330	CAPACITOR	L13	PU48530-471J	PEAKING COIL, 470 MICRO
C220	QCSB1HJ-220	CAPACITOR	L14	PU59152-680J	PEAKING COIL, 68 MICRO
C221	QCSB1HJ-680	CAPACITOR	L15	PU48530-101K	PEAKING COIL, 100 MICRO
C222	QCB81HJ-101	CAPACITOR			

REF NO.	PART NO.	PART NAME, DESCRIPTION
L16	PU48530-471K	PEAKING COIL, 470 MICRO
L17	PU48530-560J	PEAKING COIL, 56 MICRO
L18	PU59152-121J	PEAKING COIL, 120 MICRO
L19	PU59152-820J	PEAKING COIL, 82 MICRO
L20	PU59152-680J	PEAKING COIL, 68 MICRO
L21	PU48530-101K	PEAKING COIL, 100 MICRO
L22	PU48530-101K	PEAKING COIL, 100 MICRO
L23	PU48530-101K	PEAKING COIL, 100 MICRO
L24	PU48530-101K	PEAKING COIL, 100 MICRO
L25	PU59152-820J	PEAKING COIL, 82 MICRO
L26	PU48530-101K	PEAKING COIL, 100 MICRO
L27	PU48530-101K	PEAKING COIL, 100 MICRO
L28	PU48530-151K	PEAKING COIL, 150 MICRO
L29	PU48530-101K	PEAKING COIL, 100 MICRO
L30	PU48530-101K	PEAKING COIL, 100 MICRO
L31	PU59152-270J	PEAKING COIL, 27 MICRO
L32	PU48530-1R0K	PEAKING COIL, 1 MICRO
L33	PU59152-330J	PEAKING COIL, 33 MICRO
L34	PU53223-1R0G	PEAKING COIL, 1 MICRO
L35	PU59152-1R2K	PEAKING COIL, 1.2 MICRO
L36	PU53223-1R0G	PEAKING COIL, 1 MICRO
L37	PU59152-820J	PEAKING COIL, 82 MICRO
L301	PU60165-120G	PEAKING COIL, 12 MICRO
L302	PU59153-101K	INDUCTOR, 100 MICRO
L303	PU48530-471J	PEAKING COIL, 470 MICRO
L304	PU48530-222J	PEAKING COIL, 2.2M
L305	PU59152-150J	PEAKING COIL, 15 MICRO
L306	PU48530-101K	PEAKING COIL, 100 MICRO
L307	PU48530-271J	PEAKING COIL, 270 MICRO
L308	PU58308-822J	COIL, 8.2M
L309	PU48530-101K	PEAKING COIL, 100 MICRO
L311	PU48530-102J	PEAKING COIL, 1M
L312	PU59152-181J	PEAKING COIL, 180 MICRO
L313	PU59152-181J	PEAKING COIL, 180 MICRO
L314	PU59152-820J	PEAKING COIL, 82 MICRO
EQ1	PU60429	EQUALIZER
EQ3	PU60099	EQUALIZER
EQ302	PU60432	EQUALIZER
LPF1	PU60054-2	LOW PASS FILTER
LPF2	PU60097-2	LOW PASS FILTER
LPF3	PU60427	LOW PASS FILTER
LPF4	PU60179	LOW PASS FILTER
LPF5	PU60443	LOW PASS FILTER
LPF301	PU60430-2	LOW PASS FILTER
BPF1	PU57399-2	BAND PASS FILTER
OR	PU57399-3	BAND PASS FILTE
BPF2	PU60428	BAND PASS FILTER
BPF3	PU57399-2	BAND PASS FILTER
OR	PU57399-3	BAND PASS FILTE
BPF301	PU60431	BAND PASS FILTER
DL301	PU60227	1H DELAY LINE
DL302	PU58294	DELAY LINE
X301	PU60059	CRYSTAL RESONATOR
OR	PU60323	CRYSTAL RESONATOR
T301	PU60057-2	T FILTER
T302	PU58295	COIL, CNR NC BALANCE
SLD1	PU36446	SHIELD CASE
SLD2	PU60425	SHIELD COVER
SLD3	PU60426	SHIELD PLATE
TP	PU57545	TEST PIN, X6

REF NO.	PART NO.	PART NAME, DESCRIPTION
SPC1	PQM30029-25	SPACER
CN1	PU58844-9	CAP HOUSING
CN2	PU58844-4	CAP HOUSING
CN3	PU58844-3	CAP HOUSING
CN4	PU58844-14	CAP HOUSING
CN5	PU58844-10	CAP HOUSING
CN6	PU60417-8	CAP HOUSING
CN7	PU58844-4	CAP HOUSING
CN8	PU60417-5	CAP HOUSING
CN9	PU59555-2	CAP HOUSING
CN10	PU58844-2	CAP HOUSING
CN11	PU58844-2	CAP HOUSING
CN12	PU58844-6	CAP HOUSING
CN13	PU58844-4	CAP HOUSING
CN14	PU58844-7	CAP HOUSING
CN15	PU58844-3	CAP HOUSING
CP1	ICP-F10	CIRCUIT PROTECT
-SERVO SECTION-		
IC421	HD49712ANT	IC
IC461	BU2767S	IC
Q402	DTA124ES	TRANSISTOR
OR	UN4112	TRANSISTOR
OR	2SA1346	TRANSISTOR
Q403	DTA124ES	TRANSISTOR
OR	UN4112	TRANSISTOR
OR	2SA1346	TRANSISTOR
Q404	DTA124ES	TRANSISTOR
OR	UN4112	TRANSISTOR
OR	2SA1346	TRANSISTOR
Q405	DTA124ES	TRANSISTOR
OR	UN4112	TRANSISTOR
OR	2SA1346	TRANSISTOR
Q406	DTC124ES	TRANSISTOR
OR	UN4212	TRANSISTOR
OR	2SC3400	TRANSISTOR
Q408	2SA1309Q,R,S	TRANSISTOR
Q422	2SC3311A	TRANSISTOR
Q423	DTA124ES	TRANSISTOR
OR	UN4112	TRANSISTOR
OR	2SA1346	TRANSISTOR
Q461	DTA124ES	TRANSISTOR
OR	2SA1346	TRANSISTOR
OR	UN4112	TRANSISTOR
Q463	2SD1468S(SE)	TRANSISTOR
Q464	2SD1468S(SE)	TRANSISTOR
Q465	DTC124ES	TRANSISTOR
OR	UN4212	TRANSISTOR
OR	2SC3400	TRANSISTOR
D401	HSS101-01	DIODE
OR	1SS101	DIODE
D405	1SS133	DIODE
OR	MA165	DIODE
D406	1SS133	DIODE
OR	MA165	DIODE
D407	1SS133	DIODE
OR	MA165	DIODE
D408	1SS133	DIODE
OR	MA165	DIODE
D409	1SS133	DIODE
OR	MA165	DIODE
D421	1SS133	DIODE
OR	MA165	DIODE
D422	1SS133	DIODE

# REF NO. PART NO.	PART NAME, DESCRIPTION	# REF NO. PART NO.	PART NAME, DESCRIPTION
	OR MA165		
D423	1SS133		DIODE
	OR MA165		DIODE
D424	1SS133		DIODE
	OR MA165		DIODE
D425	1SS133		DIODE
	OR MA165		DIODE
D426	1SS133		DIODE
	OR MA165		DIODE
D461	11E2		DIODE
D465	1SS133		DIODE
	OR MA165		DIODE
D467	1SS133		DIODE
	OR MA165		DIODE
D468	1SS133		DIODE
	OR MA165		DIODE
D470	1SS133		DIODE
D473	1SS133		DIODE
D474	1SS133		DIODE
R401	QRD161J-102		RESISTOR
R403	QRD161J-823		RESISTOR
R406	QRD161J-472		RESISTOR
R407	QRD161J-393		RESISTOR
R408	QVZ3518-474		V RESISTOR, EP X2 PRESET
R409	QRD161J-274		RESISTOR
R410	QVZ3518-474		V RESISTOR, SP X2 PRESET
R414	QRD161J-335		RESISTOR
R415	QRD161J-823		RESISTOR
R416	QRD161J-331		RESISTOR
R417	QRD161J-223		RESISTOR
R421	QRD161J-102		RESISTOR
R422	QRD161J-155		RESISTOR
R425	QRD161J-105		RESISTOR
R426	QRD161J-562		RESISTOR
R428	QRD161J-222		RESISTOR
R429	QRD161J-563		RESISTOR
R430	QRD161J-105		RESISTOR
R431	QRD161J-123		RESISTOR
R432	QRD161J-223		RESISTOR
R433	QRD161J-392		RESISTOR
R434	QRD161J-473		RESISTOR
R435	QRD161J-105		RESISTOR
R436	QRD161J-105		RESISTOR
R437	QRD161J-105		RESISTOR
R438	QRD161J-393		RESISTOR
R439	QRD161J-223		RESISTOR
R440	QRD161J-105		RESISTOR
R441	QRD161J-823		RESISTOR
R443	QRD161J-102		RESISTOR
R444	QRD161J-124		RESISTOR
R445	QVZ3518-474		V RESISTOR, SP PB SW POINT
R446	QRD161J-103		RESISTOR
R447	QRD161J-222		RESISTOR
R448	QRD161J-221		RESISTOR
R449	QRD161J-223		RESISTOR
R450	QRD161J-472		RESISTOR
R451	QRD161J-103		RESISTOR
R452	QRD161J-102		RESISTOR
R453	QRD161J-103		RESISTOR
R454	QRD161J-561		RESISTOR
R455	QRD161J-223		RESISTOR
R456	QRD161J-682		RESISTOR
R457	QRD161J-102		RESISTOR
R458	QRD161J-474		RESISTOR
R459	QRD161J-103		RESISTOR
R460	QRD161J-102		RESISTOR
R461	QRD161J-103		RESISTOR
R466	QRD161J-684		RESISTOR
R467	QRD161J-564		RESISTOR
R468	QRD161J-104		RESISTOR
R469	QRD162J-683		RESISTOR
R470	QRD161J-154		RESISTOR
R471	QRD161J-564		RESISTOR
R472	QVZ3518-224		V RESISTOR, SLOW TK PRESET(SP)
R473	QRD161J-394		RESISTOR
R474	QRD161J-124		RESISTOR
R475	QRD161J-222		RESISTOR
R485	QRD161J-123		RESISTOR
R486	QRD161J-822		RESISTOR
R487	QRD161J-222		RESISTOR
R488	QRD161J-473		RESISTOR
R489	QRG019J-331S		OMF.RESISTOR
R490	QRD161J-562		RESISTOR
R491	QRD161J-473		RESISTOR
R492	QRD161J-105		RESISTOR
R494	QRD161J-683		RESISTOR
C401	QFV71HJ-124		M CAPACITOR
C403	QCF31HP-102		CAPACITOR
L401	PU59152-220		PEAKING COIL
C421	QCC31CK-102		CAPACITOR
C422	QEK61AM-226		E CAPACITOR
C423	QEK61AM-226		E CAPACITOR
C424	QCSB1HJ-150		CAPACITOR
C426	QCCB1CN-272		CAPACITOR
C427	QEK61HM-105		E CAPACITOR
C428	QCC31CK-223		CAPACITOR
C429	QCS31HJ-331		CAPACITOR
C430	QCC31CK-102		CAPACITOR
C431	QCC31CK-104		CAPACITOR
C432	QEK61AM-226		E CAPACITOR
C433	QCSB1HJ-220		CAPACITOR
C434	QCC31CK-682		CAPACITOR
C435	QFV71HJ-334		M CAPACITOR
C436	QETC1EM-475		E CAPACITOR
C437	QETC1EM-475		E CAPACITOR
C438	QETC1EM-106		E CAPACITOR
C439	QETC1EM-106		E CAPACITOR
C440	QEN61HM-225		NP E CAPACITOR
C441	QCC31CK-104		CAPACITOR
C442	QCS31HJ-101		CAPACITOR
C443	QFN31HJ-682		M CAPACITOR
C444	QEK61HM-105		E CAPACITOR
C445	QEK61AM-226		E CAPACITOR
C446	QCSB1HJ-101		CAPACITOR
C447	QCC31CK-102		CAPACITOR
C448	QCC31CK-103		CAPACITOR
C449	QCC31CK-473		CAPACITOR
C450	QCF11HP-473		CAPACITOR
C451	QCSB1HJ-680		CAPACITOR
C461	QEK61AM-226		E CAPACITOR
C463	QFV71HJ-104		M CAPACITOR
C464	QFV71HJ-474		M CAPACITOR
C465	QFN31HJ-393		M CAPACITOR
C466	QFV71HJ-393		M CAPACITOR
C467	QCSB1HJ-681		CAPACITOR
C468	QCSB1HJ-471		CAPACITOR
C471	QCC11CK-102		CAPACITOR
Δ CF461	PU60215		RESONATOR

REF NO.	PART NO.	PART NAME, DESCRIPTION
TH421	NTH5D223KA OR NTH5D223LA	THERMISTOR THERMISTOR
TP	PU57545	TEST PIN, X4
CN401	PU58844-5	CAP HOUSING
CN402	PU58844-3	CAP HOUSING
CN403	PU58844-2Y	CAP HOUSING
CN405	PU58844-4	CAP HOUSING
CN409	PU58844-2	CAP HOUSING
-SERVO SUB BOARD ASSEMBLY-		
PWBA	PB40037A	SERVO SUB BOARD ASS'Y
Q1	DTC124ES	TRANSISTOR
Q2	DTA124ES	TRANSISTOR
Q3	DTC124TS	TRANSISTOR
D1	1SS133	DIODE
D2	1SS133	DIODE
D3	1SS133	DIODE
D4	1SS133	DIODE
R1	QRD161J-272	RESISTOR
R2	QRD161J-472	RESISTOR
R3	QRD161J-104	RESISTOR

* 8. MECHACON BOARD ASSEMBLY <04> *		

PWBA	PB20123F	MECHANISM CONTROL BOARD ASS'Y
TP	PU59391	STYLE PIN
IC1	M50938-611SP	IC
IC2	BA6259N	IC
IC3	M54647L	IC
IC4	BA6222	IC
IC5	M50255P	IC
Q1	2SC1740S(RS)	TRANSISTOR
Q9	2SK656	FE TRANSISTOR
D1	HZS4.3EB2	ZENER DIODE
D2	MA165	DIODE
OR 1SS133		DIODE
D3	MA165	DIODE
OR 1SS133		DIODE
D4	MA165	DIODE
OR 1SS133		DIODE
D5	HZS7.5EB2	ZENER DIODE
D6	MA165	DIODE
OR 1SS133		DIODE
DA1	DAP209S	DIODE
OR DAP201		DIODE
R1	QRD161J-152	RESISTOR
R2	QRD161J-332	RESISTOR
R3	QRD161J-122	RESISTOR
R4	QRD161J-823	RESISTOR
R5	QRD161J-102	RESISTOR
R6	QRD161J-102	RESISTOR
R7	QRD161J-102	RESISTOR
R8	QRD161J-103	RESISTOR
R9	QRD161J-472	RESISTOR
R10	QRD161J-105	RESISTOR

REF NO.	PART NO.	PART NAME, DESCRIPTION
R11	QRD161J-472	RESISTOR
R12	QRD161J-472	RESISTOR
R13	QRD161J-472	RESISTOR
R14	QRD161J-472	RESISTOR
R15	QRD161J-472	RESISTOR
R16	QRD161J-472	RESISTOR
R17	QRD161J-472	RESISTOR
R18	QRD161J-472	RESISTOR
R19	QRD161J-472	RESISTOR
R20	QRD161J-472	RESISTOR
R21	QRD161J-472	RESISTOR
R22	QRD161J-472	RESISTOR
R23	QRD161J-472	RESISTOR
R24	QRD161J-472	RESISTOR
R25	QRD161J-472	RESISTOR
R26	QRD161J-124	RESISTOR
R27	QRD161J-124	RESISTOR
R28	QRD161J-333	RESISTOR
R29	QRD161J-101	RESISTOR
R30	QRD161J-822	RESISTOR
R31	QRD161J-103	RESISTOR
R32	QRD161J-821	RESISTOR
R34	QRD161J-472	RESISTOR
R35	QRD161J-472	RESISTOR
R36	QRD161J-333	RESISTOR
R37	QRD161J-333	RESISTOR
R38	QRD161J-331	RESISTOR
R40	QRD161J-103	RESISTOR
R41	QRD161J-103	RESISTOR
R42	QRD161J-103	RESISTOR
R48	QRD161J-223	RESISTOR
RA1	QRB037J-103	RESISTOR ARRAY
RA2	QRB049J-472	RESISTOR ARRAY
RA3	QRB049J-103	RESISTOR ARRAY
C1	QCFB1EZ-223	CAPACITOR
C2	QETC1EM-335	E CAPACITOR
C3	QCFB1EZ-223	CAPACITOR
C4	QETC1HM-105	E CAPACITOR
C5	QETC1EM-106	E CAPACITOR
C6	QETC1EM-106	E CAPACITOR
C8	QETC1EM-475	E CAPACITOR
C10	QCC11EJ-104	CAPACITOR
C13	QEK41HM-474	E CAPACITOR
C14	QCF11EZ-223	CAPACITOR
CF1	PU60414	CERAMIC FILTER
HS1	PU60158	HEAT SINK
SCW1	SBSE3006Z	TAPPING SCREW, X2
SCW2	SBSE3008Z	TAPPING SCREW
WR1	PW30112-LOAF6AH	PARALLEL WIRE
CN1	PU59934-17	WIRE HOLDER
CN2	PU58844-6	CAP HOUSING
CN3	PU58844-6	CAP HOUSING
CN4	PU60417-11	CAP HOUSING
CN5	PU60417-8	CAP HOUSING
CN6	PU58844-4	CAP HOUSING
CN7	PU60417-9	CAP HOUSING
CN8	PU58844-3	CAP HOUSING
CN9	PU58844-3R	CAP HOUSING
CN10	PU60417-8	CAP HOUSING
CN11	PU58844-3	CAP HOUSING
CN12	PU58844-3	CAP HOUSING
CN13	PU59555-2	CAP HOUSING

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
	CN14	PU58844-2	CAP HOUSING
	CN16	PU60417-8	CAP HOUSING
	CN17	PU58844-2	CAP HOUSING
	CN18	PU58844-3	CAP HOUSING
	CP1	ICP-F20	CIRCUIT PROTECT

* 9. TERMINAL BOARD ASSEMBLY <06> *			

	PWBA	PB20179E-02	TERM. BOARD ASS'Y
Δ	RF1	PU60399	RF CONVERTER/SWITCH
	R1	QRD162J-750	RESISTOR
	R2	QRD162J-750	RESISTOR
	R3	QRD162J-750	RESISTOR
	R5	QRD162J-182	RESISTOR
	R6	QRD162J-182	RESISTOR
	CL1	PU59311-2	WIRE CLAMP
	SCW1	SDSF3008Z	TAPPING SCREW, X2
Δ	TML1	PU60280-5	TERMINAL BOARD
	WR1	PW30401-AB22T	COAXIAL CORD

* 10. IF BOARD ASSEMBLY <07> *			

	PWBA	PB10087B	IF BOARD ASS'Y
	JP1	PU59935-16	TERMINAL
Δ	IC1	M51365SP	IC
	Q1	2SC3354	TRANSISTOR
	Q2	2SC3354	TRANSISTOR
Δ	Q3	2SC1317(RS)	TRANSISTOR
	Q4	2SC536SPA(FG)	TRANSISTOR
	OR	2SC3311A(RS)	TRANSISTOR
	Q5	2SC536SPA(G)	TRANSISTOR
	OR	2SC3311A(S)	TRANSISTOR
	Q6	2SA1309S	TRANSISTOR
	Q7	2SC536SPA(G)	TRANSISTOR
	OR	2SC3311A(S)	TRANSISTOR
	Q10	2SC3354	TRANSISTOR
	D1	MTZ10D	ZENER DIODE
	D6	1SS133	DIODE
	D7	1SS133	DIODE
	D8	1SS133	DIODE
	R3	NRD718J-331NBU	RESISTOR
	R4	NRD718J-472NBU	RESISTOR
	R5	NRD718J-151NBU	RESISTOR
	R6	NRD718J-102NBU	RESISTOR
	R7	NRD718J-471NBU	RESISTOR
	R8	NRD718J-561NYU	RESISTOR
	R9	NRD718J-331NBU	RESISTOR
	R10	NRD718J-470NBU	RESISTOR
	R11	NRD718J-220NBU	RESISTOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R17	NRD718J-562NBU	RESISTOR
	R18	NRD718J-332NBU	RESISTOR
	R19	NRD718J-222NBU	RESISTOR
	R20	NRD718J-222NBU	RESISTOR
	R21	QVZ3518-472	V RESISTOR, RF AGC
	R22	NRD718J-824NBU	RESISTOR
	R24	NRD718J-102NBU	RESISTOR
	R25	NRD718J-821NBU	RESISTOR
	R26	NRD718J-104NBU	RESISTOR
	R27	NRD718J-104NBU	RESISTOR
	R28	NRD718J-104NBU	RESISTOR
	R31	NRD718J-222NBU	RESISTOR
	R33	NRD718J-223NBU	RESISTOR
	R34	NRD718J-470NBU	RESISTOR
	R35	NRD718J-561NBU	RESISTOR
	R36	NRD718J-561NBU	RESISTOR
	R37	NRD718J-391NBU	RESISTOR
	R38	NRD718J-152NBU	RESISTOR
	R39	NRD718J-152NBU	RESISTOR
	R40	QVZ3518-682	V RESISTOR, COLOR LEVEL
	R41	NRD718J-471NBU	RESISTOR
	R45	NRD718J-471NBU	RESISTOR
	R46	NRD718J-104NBU	RESISTOR
	R47	NRD718J-103NBU	RESISTOR
	R48	NRD718J-562NBU	RESISTOR
	R49	NRD718J-103NBU	RESISTOR
	R50	NRD718J-471NBU	RESISTOR
	R51	NRD718J-223NBU	RESISTOR
	R52	NRD718J-223NBU	RESISTOR
	R53	NRD718J-103NBU	RESISTOR
	R54	NRD718J-562NBU	RESISTOR
	R57	NRD718J-123NBU	RESISTOR
	R60	NRD718J-680NBU	RESISTOR
	R61	NRD718J-331NBU	RESISTOR
	R62	NRD718J-472NBU	RESISTOR
	R63	NRD718J-101NBU	RESISTOR
	R64	NRD718J-561NBU	RESISTOR
	R65	NRD718J-151NBU	RESISTOR
	R66	NRD718J-470NYU	RESISTOR
	R71	QRD161J-271	RESISTOR
	C2	NCT02CH-3R3NBR	CAPACITOR
	C3	QCT25CH-750	CAPACITOR
	C4	NCT02CH-3R3NBR	CAPACITOR
	C5	NCB71HK-102NBR	CAPACITOR
	C6	NCB71HK-102NBR	CAPACITOR
	C7	NCB71HK-102NBR	CAPACITOR
	C8	NCB71HK-102NBR	CAPACITOR
	C9	NCB71HK-102NBR	CAPACITOR
	C10	QETC1CM-336	E CAPACITOR
	C11	NCY71CM-103NBR	CAPACITOR
	C13	NCY71CM-103NBR	CAPACITOR
	C14	PU57601-474ME	E CAPACITOR
	C15	QETC1CM-336	E CAPACITOR
	C16	NCF71EZ-223NBR	CAPACITOR
	C17	NCF71EZ-223NBR	CAPACITOR
	C18	QFV71HJ-104	M CAPACITOR
	C19	NCB71HK-102NBR	CAPACITOR
	C20	NCY71CM-103NBR	CAPACITOR
	C21	NCB71HK-101NBR	CAPACITOR
	C22	QETC1HM-105	E CAPACITOR
	C24	QETC1HM-105	E CAPACITOR
	C25	NCB71HK-102NBR	CAPACITOR
	C26	QFN31HJ-123	M CAPACITOR
	C27	QETC1HM-474	E CAPACITOR
	C28	NCT02CH-100NBR	CAPACITOR

REF NO.	PART NO.	PART NAME, DESCRIPTION
C29	NCS71HJ-330NBR	CAPACITOR
C30	NCY71CM-103NBR	CAPACITOR
C31	QETC1HM-335	E CAPACITOR
C32	NCF71EZ-223NBR	CAPACITOR
C33	QETC1HM-474	E CAPACITOR
C39	NCB71HK-102NYR	CAPACITOR
C41	NCB71HK-102NBR	CAPACITOR
C42	QCT25CH-680	CAPACITOR
C43	NCB71HK-102NBR	CAPACITOR
C44	NCT02CH-1R0NYR	CAPACITOR
C45	QCT25HH-121	CAPACITOR
C46	NCT02CH-5R6NBR	CAPACITOR
C50	QETC1CM-336	E CAPACITOR
L2	PU60025-R68	PEAKING COIL, 0.68 MICRO
L3	PU60025-1R0	PEAKING COIL, 1 MICRO
L4	PU54223-180K	PEAKING COIL, 18 MICRO
L5	PU54223-270J	PEAKING COIL, 27 MICRO
L6	PU54223-470J	PEAKING COIL, 47 MICRO
CF1	PU58558-Z	CERAMIC FILTER
CF3	PU59039-Z	CERAMIC FILTER
SAW1	PU36386-3	SAW FILTER
T1	PU60042-2	COIL
T2	PU60027-01-01	IF TRANSFORMER, VCO
T3	PU60028	IF TRANSFORMER, AFC
T4	PU60104	IF TRANSFORMER
T5	PU55184	IF TRANSFORMER
T6	PU60548	COIL
T7	PU60258-2	COIL
T8	PU60264	COIL (2FH)

* 11. TUNER CONTROL BOARD ASSEMBLY <08> *		

PWBA	PB10003S	TUNER CTL BOARD ASS'Y
TNR1	PU36419-2	TUNER
IC1	TD6358P	IC
Q1	2SC3311A(S)	TRANSISTOR
Q3	OR 2SC1740S(S)	TRANSISTOR
Q5	2SC1317(S)	TRANSISTOR
Q6	UN4319VI	TRANSISTOR
Q7	UN4319VI	TRANSISTOR
Q8	UN4319VI	TRANSISTOR
Q13	2SC3399	TRANSISTOR
	OR DTC144ES	TRANSISTOR
D1	HZ30-2	ZENER DIODE
D2	E-452-2	DIODE
D4	1SS136	DIODE
D5	1SS133	DIODE
R1	NRD718J-333NBU	RESISTOR
R2	NRD718J-153NBU	RESISTOR
R3	NRD718J-121NBU	RESISTOR
R7	NRD718J-221NBU	RESISTOR
R14	NRD718J-102NBU	RESISTOR
R15	NRD718J-102NBU	RESISTOR
R16	NRD718J-102NBU	RESISTOR

REF NO.	PART NO.	PART NAME, DESCRIPTION
R19	NRD718J-102NBU	RESISTOR
R22	NRD718J-184NBU	RESISTOR
R51	NRD718J-103NBU	RESISTOR
R52	NRD718J-103NBU	RESISTOR
R55	QRD161J-750	RESISTOR
C1	QFN31HK-223	M CAPACITOR
C2	QFV71HJ-474	M CAPACITOR
	OR QFZ9011-474Z	MM CAPACITOR
C3	QETC1HM-106	E CAPACITOR
C4	QETC1CM-106	E CAPACITOR
C5	QETC1CM-336	E CAPACITOR
C7	NCS71HJ-270NBR	CAPACITOR
C8	NCS71HJ-270NBR	CAPACITOR
C9	NCY71CM-103NBR	CAPACITOR
C10	NCY71CM-103NBR	CAPACITOR
C11	NCY71CM-103NBR	CAPACITOR
C13	NCY71CM-103NBR	CAPACITOR
C14	NCY71CM-103NBR	CAPACITOR
C15	QEK61AM-336	E CAPACITOR
C16	NCY71CM-103NBR	CAPACITOR
C30	QETC1HM-225	E CAPACITOR
C40	QCF11HP-103	CAPACITOR
C43	QCB81HJ-102	CAPACITOR
C45	QCB81HJ-102	CAPACITOR
X1	PU60029	CRYSTAL RESONATOR
HD1	PQ32168-1-3	HOLDER
SLD1	PU36374-01-01	SHIELD CASE
SLD2	PU36375	SHILD COVER
SLD3	PU36376	SHILD PLATE
CN1	PU58844-2	CAP HOUSING
CN2	PU58844-4	CAP HOUSING
CN3	PU60417-6	CAP HOUSING
CN5	PU58844-3	CAP HOUSING

* 12. AUDIO BOARD ASSEMBLY <09> *		

PWBA	PB20124C-01	AUDIO BOARD ASS'Y
IC1	AN3380NK	IC
IC2	TA7361AP	IC
IC3	PB20167B	FMA MODULE
IC101	UPC78N05	IC
Q1	DTC144ES	TRANSISTOR
Q2	2SC3311(RS)	TRANSISTOR
Q3	DTC144ES	TRANSISTOR
Q4	2SC1740S(RS)	TRANSISTOR
Q5	DTC124ES	TRANSISTOR
Q6	DTC124ES	TRANSISTOR
Q7	DTC124ES	TRANSISTOR
Q8	DTA114ES	TRANSISTOR
Q9	DTA114ES	TRANSISTOR
Q10	2SC1740S(RS)	TRANSISTOR
Q11	DTC143TS	TRANSISTOR
Q12	DTC143TS	TRANSISTOR
Q13	DTC143TS	TRANSISTOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
Q16		DTA114ES	TRANSISTOR
Q17		DTA114ES	TRANSISTOR
Q18		2SC3311(RS)	TRANSISTOR
Q22		DTC143TS	TRANSISTOR
Q23		2SC1740S(RS)	TRANSISTOR
Q24		2SC1740S(RS)	TRANSISTOR
Q26		DTA114ES	TRANSISTOR
Q27		DTA114ES	TRANSISTOR
Q29		DTC124ES	TRANSISTOR
Q31		2SD1468S(RS)	TRANSISTOR
D1		1SS133	DIODE
D2		1SS133	DIODE
D4		1SS133	DIODE
	OR	MA165	DIODE
D5		1SS133	DIODE
	OR	MA165	DIODE
D6		1SS133	DIODE
	OR	MA165	DIODE
D7		1SS133	DIODE
	OR	MA165	DIODE
D8		1SS133	DIODE
	OR	MA165	DIODE
D9		HZ2BLL	ZENER DIODE
D10		1SS133	DIODE
	OR	MA165	DIODE
D11		1SS133	DIODE
	OR	MA165	DIODE
D12		1SS133	DIODE
	OR	MA165	DIODE
D14		1SS133	DIODE
	OR	MA165	DIODE
D15		1SS133	DIODE
	OR	MA165	DIODE
D16		HZ5A2	ZENER DIODE
D20		1SS133	DIODE
	OR	MA165	DIODE
D21		1SS133	DIODE
	OR	MA165	DIODE
D22		1SS133	DIODE
	OR	MA165	DIODE
D24		1SS133	DIODE
	OR	MA165	DIODE
D25		1SS133	DIODE
	OR	MA165	DIODE
D26		1SS133	DIODE
	OR	MA165	DIODE
D27		1SS133	DIODE
	OR	MA165	DIODE
D28		1SS133	DIODE
	OR	MA165	DIODE
D29		1SS133	DIODE
	OR	MA165	DIODE
D33		DAN209S	DIODE
D34		1SS133	DIODE
	OR	MA165	DIODE
D35		1SS133	DIODE
	OR	MA165	DIODE
D36		HZ4A1	ZENER DIODE
R1		QRD161J-123	RESISTOR
R2		QRD161J-153	RESISTOR
R3		QRD161J-102	RESISTOR
R4		QRD161J-682	RESISTOR
R5		QRD161J-472	RESISTOR
R6		QRD161J-152	RESISTOR
R7		QRD161J-222	RESISTOR
R8		QRD161J-100	RESISTOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
R9		QVZ3518-473	V RESISTOR, BIAS ADJ
R10		QRD161J-102	RESISTOR
R11		QRD162J-104	RESISTOR
R12		QRD161J-102	RESISTOR
R13		QRD161J-273	RESISTOR
R14		QRD161J-3R9	RESISTOR
R15		QRD161J-103	RESISTOR
R16		QRD161J-562	RESISTOR
R17		QRD181J-102	RESISTOR
R19		QRD161J-103	RESISTOR
R20		QRD161J-223	RESISTOR
R21		QRD161J-151	RESISTOR
R22		QRD161J-151	RESISTOR
R23		QRD161J-243	RESISTOR
R24		QRD161J-392	RESISTOR
R25		QRD161J-103	RESISTOR
R26		QRD161J-274	RESISTOR
R27		QRD161J-391	RESISTOR
R28		QVZ3518-102	V RESISTOR, PB LEVEL
R31		QRD161J-103	RESISTOR
R34		QRD161J-122	RESISTOR
R36		QRD161J-182	RESISTOR
R38		QRD161J-182	RESISTOR
R40		QVZ3518-222	V RESISTOR, L CH E-E LEVEL
R41		QVZ3518-222	V RESISTOR, R CH E-E LEVEL
R42		QRD161J-333	RESISTOR
R43		QRD161J-101	RESISTOR
R44		QRD161J-101	RESISTOR
R45		QRD161J-392	RESISTOR
R46		QRD161J-332	RESISTOR
R47		QRD161J-153	RESISTOR
R48		QRD161J-223	RESISTOR
R49		QRD161J-274	RESISTOR
R50		QRD161J-222	RESISTOR
R51		QRD161J-222	RESISTOR
R52		QRD161J-103	RESISTOR
R53		QRD162J-333	RESISTOR
R54		QRD161J-183	RESISTOR
R55		QRD161J-472	RESISTOR
R56		QRD161J-152	RESISTOR
R57		QRD161J-271	RESISTOR
R58		QRD162J-333	RESISTOR
R60		QRD161J-333	RESISTOR
R61		QRD161J-333	RESISTOR
R62		QRD161J-822	RESISTOR
R65		QRD161J-223	RESISTOR
R66		QRD161J-6R8	RESISTOR
R67		QRD161J-103	RESISTOR
R69		QVZ3518-331	V RESISTOR, REC FM LEVEL
R70		QRD161J-273	RESISTOR
R73		QRD161J-151	RESISTOR
R74		QRD161J-151	RESISTOR
R76		QRD161J-333	RESISTOR
R77		QRD181J-223	RESISTOR
R78		QRD161J-223	RESISTOR
R79		QRD161J-820	RESISTOR
R80		QRD161J-151	RESISTOR
R81		QRD161J-223	RESISTOR
R82		QRD162J-153	RESISTOR
R83		QRD162J-103	RESISTOR
R84		QRD161J-104	RESISTOR
R85		QRD162J-102	RESISTOR
R86		QRD161J-100	RESISTOR
R87		QRD161J-104	RESISTOR
R88		QRD161J-562	RESISTOR

REF NO. PART NO. PART NAME, DESCRIPTION

R91	QRD161J-331	RESISTOR
C1	QEK61CM-106	E CAPACITOR
C2	QETC1AM-476	E CAPACITOR
C3	QEP61CM-106	NP E CAPACITOR
C4	QETC1CM-106	E CAPACITOR
C5	QETC1CM-226	E CAPACITOR
C6	QETC1AM-336	E CAPACITOR
C7	QETC1AM-476	E CAPACITOR
C8	QCB81HK-102	CAPACITOR
C9	QCB81HK-101	CAPACITOR
C10	QETC1AM-336	E CAPACITOR
C11	QETC1AM-107	E CAPACITOR
C12	QETC1CM-226	E CAPACITOR
C13	QETC1CM-106	E CAPACITOR
C14	QEP61CM-106	NP E CAPACITOR
C15	QETC1AM-476	E CAPACITOR
C16	QETC1CM-106	E CAPACITOR
C17	QCB81HJ-331	CAPACITOR
C18	QFV71HJ-223	M CAPACITOR
C19	QCC11EJ-222	CAPACITOR
C20	QCC11EJ-102	CAPACITOR
C21	QEK61CM-106	E CAPACITOR
C22	QETC1HM-225	E CAPACITOR
C23	QFV71HJ-273	M CAPACITOR
C24	QCB81HK-102	CAPACITOR
C25	QEK61HM-225	E CAPACITOR
C26	QETC1AM-336	E CAPACITOR
C27	QET80JM-476	E CAPACITOR
C28	QFV71HJ-823	M CAPACITOR
C29	QFN31HJ-273	M CAPACITOR
C30	QETC1CM-106	E CAPACITOR
C31	QEP61HM-474	NP E CAPACITOR
C32	QFN31HJ-103	M CAPACITOR
C33	QFV71HJ-224	M CAPACITOR
C34	QEB51CM-685	LL CAPACITOR
C35	QEB51HM-105	LL CAPACITOR
C36	QETC1CM-106	E CAPACITOR
C37	QETC1CM-476	E CAPACITOR
C38	QETC1CM-476	E CAPACITOR
C39	QETC1HM-105	E CAPACITOR
C40	QETB1CM-106	E CAPACITOR
C43	QETC1CM-106	E CAPACITOR
C45	QETC1HM-225	E CAPACITOR
C46	QET81HM-225	E CAPACITOR
C47	QETC1HM-225	E CAPACITOR
C49	QCF31HP-223	CAPACITOR
C50	QFV71HJ-104	M CAPACITOR
C51	QFV71HJ-104	M CAPACITOR
C52	QFV71HJ-104	M CAPACITOR
C53	QCF31HP-223	CAPACITOR
C54	QETC1AM-107	E CAPACITOR
C55	QCV81CN-103	CAPACITOR
C56	QCB81HJ-102	CAPACITOR
C57	QCSC1HJ-330	CAPACITOR
C58	QCB81HJ-331	CAPACITOR
C59	QCB81HJ-102	CAPACITOR
C60	QCV81CN-103	CAPACITOR
C61	QCB81HJ-102	CAPACITOR
C62	QCV81CN-103	CAPACITOR
C63	QCC11EJ-272	CAPACITOR
C64	QETC1CM-106	E CAPACITOR
C66	QETC1HM-106	E CAPACITOR
C67	QETB1CM-106	E CAPACITOR
C72	QCB81HK-561	CAPACITOR
C73	QCB81HK-561	CAPACITOR
C74	QCC11EJ-332	CAPACITOR

REF NO. PART NO. PART NAME, DESCRIPTION

C75	QCC11EJ-102	CAPACITOR
C76	QFV71HJ-333	M CAPACITOR
C77	QETC1CM-106	E CAPACITOR
C78	QCC11EJ-222	CAPACITOR
C79	QFV71HJ-104	M CAPACITOR
C81	QEP41HM-225	NP E CAPACITOR
C103	QEK61HM-105	E CAPACITOR
C104	QETC1CM-106	E CAPACITOR
L1	PU53223-101J	PEAKING COIL, 100 MICRO
L3	PU58308-472J	PEAKING COIL, 4.7M
L4	PU54223-221J	PEAKING COIL, 220 MICRO
L5	PU54223-101J	PEAKING COIL, 100 MICRO
BPF1	PU60396	B.P.F.(1.3M)
BPF2	PU60397	B.P.F.(1.7M)
T1	PU60320	OSC TRANS
T2	PU60321	OSC TRANSFORMER
HN1	PU58018-1-2	PWB HINGE,X2
HS1	PU60261	HEAT SINK
RV1	PU52105	PLASTIC RIVET
SLD1	PU59960	P/R AMP SHIELD1
SLD2	PU59961	P/R AMP SHIELD2
SLD3	PQ43345	SHIELD PLATE
SPC1	PQM30029-44	SPACER
TP	PU55774	TEST PIN, X8
CN1	PU58844-4	CAP HOUSING
CN2	PU60417-9	CAP HOUSING
CN3	PU58844-4	CAP HOUSING
CN4	PU58844-2	CAP HOUSING
CN5	PU58844-5	CAP HOUSING
CN6	PU58844-4	CAP HOUSING
CN7	PU58844-6	CAP HOUSING
CN8	PU58844-3	CAP HOUSING
CN9	PU58844-2	CAP HOUSING
CN10	PU60417-7	CAP HOUSING
CN11	PU58844-2	CAP HOUSING

 * 13. AUDIO IN/OUT BOARD ASSEMBLY <10> *

PWBA	PB20113B	AUD. I/O BOARD ASS'Y
IC1	M5218P	IC
IC2	BA7057	IC
IC3	AN3926K	IC
IC4	AN3926K	IC
IC5	UPD4053BC	IC
IC6	M5218P	IC
IC7	M50601P	IC
Q1	2SD1450S,T	TRANSISTOR
Q2	2SC1740S(QRS)	TRANSISTOR
Q3	DTC144ES	TRANSISTOR
Q4	DTC144ES	TRANSISTOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
	Q11	2SC1740S(QRS)	TRANSISTOR
	Q12	2SC1741S(QR)	TRANSISTOR
	D1	1SS133	DIODE
	OR	MA165	DIODE
	D5	HZ6A3	DIODE
	R1	QRD161J-472	RESISTOR
	R2	QRD161J-682	RESISTOR
	R3	QRD161J-682	RESISTOR
	R4	QRD161J-472	RESISTOR
	R5	QRD161J-122	RESISTOR
	R6	QRD161J-273	RESISTOR
	R7	QRD161J-473	RESISTOR
	R8	QRD161J-473	RESISTOR
	R9	QRD161J-273	RESISTOR
	R10	QRD161J-683	RESISTOR
	R11	QRD161J-473	RESISTOR
	R12	QRD161J-561	RESISTOR
	R13	QRD161J-103	RESISTOR
	R14	QVZ3244-152	V RESISTOR, R CH LEVEL IND ADJ
	R15	QVZ3244-152	V RESISTOR, L CH LEVEL IND ADJ
	R16	QRD161J-222	RESISTOR
	R17	QRD161J-222	RESISTOR
	R18	QRD161J-562	RESISTOR
	R19	QRD161J-683	RESISTOR
	R20	QRD161J-823	RESISTOR
	R21	QRD161J-102	RESISTOR
	R22	QRD161J-102	RESISTOR
	R23	QRD161J-102	RESISTOR
	R24	QRD161J-102	RESISTOR
	R25	QRD161J-105	RESISTOR
	R26	QRD161J-105	RESISTOR
	R28	QRD161J-683	RESISTOR
	R29	QRD161J-122	RESISTOR
	R30	QRD161J-102	RESISTOR
	R31	QRD161J-102	RESISTOR
	R32	QRD161J-122	RESISTOR
	R34	QRD161J-333	RESISTOR
	R35	QRD161J-103	RESISTOR
	R36	QRD161J-103	RESISTOR
	R37	QRD161J-102	RESISTOR
	R38	QRD161J-151	RESISTOR
	R39	QRD161J-151	RESISTOR
	R40	QRD161J-102	RESISTOR
	R41	QRD161J-333	RESISTOR
	R42	QRD161J-153	RESISTOR
	R43	QRD161J-473	RESISTOR
	R44	QRD161J-153	RESISTOR
	R48	QRD161J-103	RESISTOR
	R49	QRD161J-102	RESISTOR
	R50	QRD161J-221	RESISTOR
	R51	QRD161J-221	RESISTOR
	R52	QRD161J-103	RESISTOR
	R53	QRD161J-103	RESISTOR
	R54	QRD161J-333	RESISTOR
	R55	QRD161J-333	RESISTOR
	R56	QRD161J-104	RESISTOR
	R59	QRD161J-102	RESISTOR
	R60	QRD161J-272	RESISTOR
	R61	QRD161J-332	RESISTOR
	R62	QRD161J-103	RESISTOR
	R63	QRD161J-472	RESISTOR
	R64	QRD161J-103	RESISTOR
	R65	QRD161J-102	RESISTOR
	R66	QRD161J-102	RESISTOR
	R68	QRD161J-273	RESISTOR
	R69	QRD161J-104	RESISTOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R70	QRD161J-473	RESISTOR
	R71	QRD161J-333	RESISTOR
	R73	QRD161J-101	RESISTOR
	R74	QRD161J-103	RESISTOR
	R75	QRD161J-392	RESISTOR
	R76	QRD161J-103	RESISTOR
	R77	QRD161J-392	RESISTOR
	R78	QRD161J-472	RESISTOR
	R80	QRD161J-563	RESISTOR
	RA1	RGLD4X563J	REGISTER ARRAY
	RA2	RGLD4X563J	REGISTER ARRAY
	RA3	RGLD4X563J	REGISTER ARRAY
	RA4	RGLD5X563J	REGISTER ARRAY
	C1	QEK61CM-106	E CAPACITOR
	C2	QEK61CM-106	E CAPACITOR
	C3	QEK61CM-476	E CAPACITOR
	C4	QEK61CM-106	E CAPACITOR
	C5	QEK61CM-106	E CAPACITOR
	C6	QEK61CM-106	E CAPACITOR
	C7	QEK61CM-106	E CAPACITOR
	C8	QEK61HM-105	E CAPACITOR
	C9	QEK61HM-225	E CAPACITOR
	C10	QEK61HM-225	E CAPACITOR
	C11	QEP61CM-106	NP E CAPACITOR
	C12	QEP61CM-106	NP E CAPACITOR
	C13	QEK61CM-106	E CAPACITOR
	C14	QEK61CM-106	E CAPACITOR
	C15	QEK61CM-106	E CAPACITOR
	C16	QEK61CM-106	E CAPACITOR
	C17	QEK61CM-106	E CAPACITOR
	C18	QEK61CM-106	E CAPACITOR
	C19	QEK60JM-476	E CAPACITOR
	C20	QEK61CM-106	E CAPACITOR
	C21	QEP61CM-106	NP E CAPACITOR
	C22	QEP61CM-106	NP E CAPACITOR
	C23	QEP61CM-106	NP E CAPACITOR
	C24	QEK61CM-106	E CAPACITOR
	C25	QEK60JM-476	E CAPACITOR
	C26	QEK61CM-106	E CAPACITOR
	C27	QEK61CM-106	E CAPACITOR
	C28	QEK61CM-106	E CAPACITOR
	C29	QEP61CM-106	NP E CAPACITOR
	C30	QEK61CM-106	E CAPACITOR
	C31	QEK61CM-106	E CAPACITOR
	C32	QEK61CM-106	E CAPACITOR
	C33	QEK61CM-106	E CAPACITOR
	C34	QEP61CM-106	NP E CAPACITOR
	C35	QEP61CM-106	NP E CAPACITOR
	C36	QEP61CM-106	NP E CAPACITOR
	C37	QEP61CM-106	NP E CAPACITOR
	C38	QEK60JM-476	E CAPACITOR
	C39	QEK61CM-106	E CAPACITOR
	C40	QEK61CM-106	E CAPACITOR
	C41	QEK61CM-106	E CAPACITOR
	C42	QCB81HJ-102	CAPACITOR
	C43	QEK41HM-105	E CAPACITOR
	C44	QCB81HJ-101	CAPACITOR
	C45	QCB81HJ-101	CAPACITOR
	C46	QEK61CM-106	E CAPACITOR
	C47	QCB81HJ-391	CAPACITOR
	C48	QEK61CM-106	E CAPACITOR
	C49	QEP61CM-106	NP E CAPACITOR
	C50	QCB81HJ-101	CAPACITOR
	C51	QCB81HJ-101	CAPACITOR
	C52	QCVB1CN-103	CAPACITOR
	C53	QCVB1CN-103	CAPACITOR

REF NO.	PART NO.	PART NAME, DESCRIPTION
C54	QEK61CM-476	E CAPACITOR
C55	QEK61CM-476	E CAPACITOR
C56	QEK61HM-105	E CAPACITOR
C57	QEK61HM-225	E CAPACITOR
C58	QEK61HM-475	E CAPACITOR
C59	QEK61CM-106	E CAPACITOR
C60	QEK61CM-106	E CAPACITOR
C61	QEK61CM-106	E CAPACITOR
C62	QEK40JM-336	E CAPACITOR
L1	PU53223-101J	PEAKING COIL, 100 MICRO
L2	PU53223-101J	PEAKING COIL, 100 MICRO
CF1	PU51190	RESONATOR
SLD1	PQ42994	SHIELD PLATE
SLD2	PQ42995	SHIELD CASE
SLD3	PQ43207	SHIELD COVER
CN1	PU58844-4	CAP HOUSING
CN2	PU58844-2	CAP HOUSING
CN3	PU58844-3	CAP HOUSING
CN4	PU58844-6	CAP HOUSING
CN5	PU58844-3	CAP HOUSING
CN6	PU58844-6	CAP HOUSING
CN8	PU58844-2	CAP HOUSING
CN9	PU58844-3	CAP HOUSING
CN10	PU58844-3	CAP HOUSING
CN11	PU58844-5	CAP HOUSING
CN12	PU58844-5	CAP HOUSING

* 14. AUDIO/CONTROL HEAD BOARD <12> *		

PWB1	PU57643-1-2	AUDIO/CTL HEAD BOARD
BKT1	PQ43014	BRACKET
SCW1	SPSH1740	MINI SCREW
CN1	PU54537-5	CAP HOUSING
CN2	PU54537-2	CAP HOUSING

* 15. DEMODULATOR BOARD ASSEMBLY <14> *		

PWBA	PB20129B	DEMOD BOARD ASS'Y
IC1	CX20112	IC
IC2	CXA1011P	IC
IC3	CXA1011P	IC
IC4	M5239L	IC
Q1	2SD1468S(SE)	TRANSISTOR
Q2	2SD1468S(SE)	TRANSISTOR
Q3	2SD1468S(SE)	TRANSISTOR
Q4	DTA114ES	TRANSISTOR
Q5	DTA144WS	TRANSISTOR
Q7	2SD1450S,T	TRANSISTOR
Q8	2SC1740S(RS)	TRANSISTOR
Q9	2SC1740S(RS)	TRANSISTOR
Q10	2SC1740S(RS)	TRANSISTOR

REF NO.	PART NO.	PART NAME, DESCRIPTION
D1	MTZ100	ZENER DIODE
D2	MTZ6.8B	ZENER DIODE
D3	1SS133	DIODE
D4	1SS133	DIODE
D5	1SS133	DIODE
D8	1SS133	DIODE
D9	1SS133	DIODE
D12	1SS133	DIODE
D13	1SS133	DIODE
D15	1SS133	DIODE
D16	1SS133	DIODE
R1	QRD161J-822	RESISTOR
R2	QRV144F-1203A	C.M.F RESISTOR
R3	QVZ3531-333	V RESISTOR,STEREO FILTER ADJ
R4	QRV144F-1203A	C.M.F RESISTOR
R5	QVZ3531-333	V RESISTOR,SAP FIL ADJ
R6	QRD161J-154	RESISTOR
R11	QRD161J-103	RESISTOR
R13	QRD161J-471	RESISTOR
R14	QRD161J-471	RESISTOR
R15	QRD161J-103	RESISTOR
R16	QRD161J-102	RESISTOR
R17	QRD161J-102	RESISTOR
R18	QVZ3518-472	V RESISTOR,SAP LEVEL
R19	QVZ3518-103	V RESISTOR,SEPARATION
R20	QRD161J-362	RESISTOR
R21	QRD161J-224	RESISTOR
R22	QVZ3518-104	V RESISTOR,OUTPUT LEVEL (L+R)
R23	QVZ3531-332	V RESISTOR,STEREO VCO ADJ
R24	QRD161J-332	RESISTOR
R25	QRD161J-561	RESISTOR
R26	QVZ3518-103	V RESISTOR,LEVEL (L-R)
R27	QRV144F-5603A	C.M.F RESISTOR
R28	QRV144F-2322A	C.M.F RESISTOR
R29	QRD161J-222	RESISTOR
R30	QRD161J-182	RESISTOR
R31	QRD161J-473	RESISTOR
R32	QRD161J-361	RESISTOR
R33	QRD161J-301	RESISTOR
R34	QRD161J-682	RESISTOR
R35	QRD161J-752	RESISTOR
R36	QVZ3518-682	V RESISTOR,SPECTRUM
R37	QRV144F-5603A	C.M.F RESISTOR
R38	QRV144F-2322A	C.M.F RESISTOR
R39	QRD161J-272	RESISTOR
R40	QRD161J-561	RESISTOR
R41	QRD161J-153	RESISTOR
R42	QRD161J-361	RESISTOR
R43	QRD161J-682	RESISTOR
R44	QRD161J-752	RESISTOR
R45	QRD161J-272	RESISTOR
R46	QRD161J-102	RESISTOR
R47	QRD161J-102	RESISTOR
R48	QRD161J-332	RESISTOR
R49	QRD161J-332	RESISTOR
R50	QRD161J-332	RESISTOR
R53	QRD182J-271	RESISTOR
R54	QRD161J-301	RESISTOR
R55	QVZ3518-472	V RESISTOR,SAP LEVEL
R56	QRD161J-683	RESISTOR
R57	QRD161J-183	RESISTOR
R58	QRD161J-221	RESISTOR
R59	QRD161J-104	RESISTOR
R60	QRD161J-104	RESISTOR
R61	QRD161J-153	RESISTOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
R62		QRD161J-472	RESISTOR
R63		QRD161J-125	RESISTOR
R64		QRD161J-472	RESISTOR
R65		QRD161J-392	RESISTOR
R67		QRD161J-473	RESISTOR
R70		QRD161J-103	RESISTOR
R73		QRD161J-103	RESISTOR
R74		QRD161J-103	RESISTOR
R76		QRV144F-1002A	C.M.F RESISTOR
R78		QRD161J-822	RESISTOR
R79		QRD161J-102	RESISTOR
C1		QEK61CM-106	E CAPACITOR
C2		QCC11EK-473	CAPACITOR
C3		QEK61CM-106	E CAPACITOR
C4		QCC11EK-223	CAPACITOR
C5		QEK61HM-105	E CAPACITOR
C6		QEK61HM-105	E CAPACITOR
C8		QFL31HJ-472	M CAPACITOR
C10		QEK61CM-106	E CAPACITOR
C11		QEK61CM-106	E CAPACITOR
C12		QFV71HJ-223	M CAPACITOR
C13		QEK61CM-106	E CAPACITOR
C14		PU58285-182J	PP CAP, 1800P +5,-5% /50V
C15		QEK61HM-105	E CAPACITOR
C16		QEK61EM-475	E CAPACITOR
C17		QEK61CM-106	E CAPACITOR
C18		QEK61CM-106	E CAPACITOR
C19		QEK61CM-106	E CAPACITOR
C20		QEE81CJ-335	TA.CAP
C21		QEK61HM-105	E CAPACITOR
C22		QEE81CJ-106	TA.CAP
C23		QEK61HM-225	E CAPACITOR
C24		QEK61CM-106	E CAPACITOR
C25		QETC1CM-107	E CAPACITOR
C26		QFL31HJ-472	M CAPACITOR
C27		QEK61HM-105	E CAPACITOR
C28		QEN61CM-106	NP E CAPACITOR
C29		QFV71HJ-223	M CAPACITOR
C30		QFV71HJ-104	M CAPACITOR
C31		QEK61HM-105	E CAPACITOR
C32		QEK61CM-106	E CAPACITOR
C33		QEE81CJ-335	TA.CAP
C34		QEK61HM-105	E CAPACITOR
C35		QEE81CJ-106	TA.CAP
C36		QEK61HM-225	E CAPACITOR
C37		QEK61CM-106	E CAPACITOR
C38		QETC1CM-107	E CAPACITOR
C39		QFL31HJ-152	M CAPACITOR
C41		QEN61CM-106	NP E CAPACITOR
C42		QFV71HJ-223	M CAPACITOR
C43		QFV71HJ-104	M CAPACITOR
C44		QEK61HM-105	E CAPACITOR
C45		QEK61CM-106	E CAPACITOR
C46		QCSB1HJ-220	CAPACITOR
C47		QETC1CM-107	E CAPACITOR
C48		QCVB1CN-103	CAPACITOR
C49		QCB81HJ-221	CAPACITOR
C50		QEK61HM-105	E CAPACITOR
C51		QFL31HJ-102	M CAPACITOR
C52		QCB81HJ-331	CAPACITOR
C58		QFV71HJ-123	M CAPACITOR
C59		QFV71HJ-123	M CAPACITOR
L1		PU60036-821K	COIL, 820 MICRO
L2		PU60211	L.P.FILTER
L3		PU60211	L.P.FILTER
L4		PU53223-1R0H	PEAKING COIL, 1 MICRO

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
CN1		PU58844-6	CAP HOUSING
CN2		PU58844-3	CAP HOUSING
CN3		PU58844-3	CAP HOUSING
CN4		PU58844-2	CAP HOUSING

* 16. DIGITAL BOARD ASSEMBLY <15> *			

PWBA		PB10099A-06	DIGITAL BOARD ASSY
IC1		M51271FP	IC
IC2		NJM2217L	IC
IC3		M51272FP	IC
IC4		M51279FP	IC
IC5		NJM2217L	IC
IC6		M50747-622FP	IC
IC7		M65011FP-C	IC
IC8		M52678FP	IC
IC9		M52678FP	IC
IC10		M5M4C500L-10	IC
IC11		M5M4C500L-10	IC
IC12		M5M4C500L-10	IC
IC13		M52679FP	IC
IC14		M52679FP	IC
IC15		M52679FP	IC
IC16		UPD74HC00G	IC
IC17		TD62003F	IC
IC18		TD62003F	IC
IC19		UPC393C	IC
IC20		TC74HC4053AF	IC
IC21		TC74HC4053AF	IC
IC22		TC74HC02F	IC
IC23		TC74HC02F	IC
Q1		2SC2412K(RS)	TRANSISTOR
Q2		2SA1037K(RS)	TRANSISTOR
Q3		2SA1037K(RS)	TRANSISTOR
Q4		2SA1037K(RS)	TRANSISTOR
Q5		2SA1037K(RS)	TRANSISTOR
Q6		2SC2412K(RS)	TRANSISTOR
Q7		2SA1037K(RS)	TRANSISTOR
Q8		2SC2412K(RS)	TRANSISTOR
Q9		2SC2412K(RS)	TRANSISTOR
Q10		DTC144EK	TRANSISTOR
Q11		2SC2412K(RS)	TRANSISTOR
Q12		2SA1037K(RS)	TRANSISTOR
D1		DAN202K	DIODE
D2		DAP202K	DIODE
D3		MA151WK	DIODE
D4		MA151WK	DIODE
D5		DAN202K	DIODE
R1		QRSA08J-153YN	RESISTOR
R2		QRSA08J-123YN	RESISTOR
R3		QRSA08J-222YN	RESISTOR
R4		QRSA08J-182YN	RESISTOR
R5		QRSA08J-102YN	RESISTOR
R6		QRSA08J-562YN	RESISTOR
R7		QRSA08J-123YN	RESISTOR
R8		QRSA08J-473YN	RESISTOR
R9		QRSA08J-823YN	RESISTOR
R10		QRSA08J-222YN	RESISTOR
R11		QRSA08J-102YN	RESISTOR

REF NO.	PART NO.	PART NAME, DESCRIPTION
R12	QRSA08J-102YN	RESISTOR
R13	QRSA08J-102YN	RESISTOR
R14	QRSA08J-102YN	RESISTOR
R15	QRSA08J-562YN	RESISTOR
R16	QRSA08J-562YN	RESISTOR
R17	QRSA08J-183YN	RESISTOR
R18	QRSA08J-333YN	RESISTOR
R19	QRSA08J-153YN	RESISTOR
R20	QVZ3513-473	V RESISTOR,COLOR LEVEL
R21	QRSA08J-474YN	RESISTOR
R22	QRSA08J-152YN	RESISTOR
R23	QVZ3513-473	V RESISTOR,COLOR PHASE
R24	QRSA08J-151YN	RESISTOR
R25	QRSA08J-331YN	RESISTOR
R26	QRSA08J-823YN	RESISTOR
R27	QRSA08J-222YN	RESISTOR
R28	QRSA08J-103YN	RESISTOR
R29	QRSA08J-223YN	RESISTOR
R30	QVZ3513-223	V RESISTOR,AFC
R31	QRSA08J-222YN	RESISTOR
R32	QRSA08J-105YN	RESISTOR
R35	QRSA08J-471YN	RESISTOR
R36	QVZ3513-103	V RESISTOR,COL DIFFERENCE BAL
R37	QVZ3513-473	V RESISTOR,CARR BALANCE(1)
R39	QRSA08J-822YN	RESISTOR
R40	QRSA08J-333YN	RESISTOR
R42	QRSA08J-102YN	RESISTOR
R43	QRSA08J-362YN	RESISTOR
R44	QRSA08J-123YN	RESISTOR
R45	QRSA08J-472YN	RESISTOR
R46	QRSA08J-471YN	RESISTOR
R47	QRSA08J-272YN	RESISTOR
R48	QVZ3513-472	V RESISTOR,BURST LEVEL
R49	QVZ3513-473	V RESISTOR,CARR BARANCE(2)
R50	QRSA08J-681YN	RESISTOR
R51	QRSA08J-102YN	RESISTOR
R52	QRSA08J-823YN	RESISTOR
R53	QRSA08J-222YN	RESISTOR
R54	QRSA08J-183YN	RESISTOR
R55	QRSA08J-333YN	RESISTOR
R56	QRSA08J-153YN	RESISTOR
R57	QRSA08J-474YN	RESISTOR
R58	QRSA08J-152YN	RESISTOR
R59	QVZ3513-473	V RESISTOR,P IN P COLOR PHASE
R60	QRSA08J-151YN	RESISTOR
R61	QRSA08J-331YN	RESISTOR
R62	QRSA08J-823YN	RESISTOR
R63	QRSA08J-103YN	RESISTOR
R64	QRSA08J-222YN	RESISTOR
R65	QRSA08J-223YN	RESISTOR
R66	QVZ3513-223	V RESISTOR,AFC
R67	QRSA08J-222YN	RESISTOR
R68	QRSA08J-105YN	RESISTOR
R69	QRSA08J-103YN	RESISTOR
R70	QRSA08J-103YN	RESISTOR
R71	QRSA08J-102YN	RESISTOR
R72	QRSA08J-331YN	RESISTOR
R73	QVZ3513-102	V RESISTOR,COLOR
R74	QRSA08J-105YN	RESISTOR
R75	QRSA08J-103YN	RESISTOR
R76	QRSA08J-105YN	RESISTOR
R77	QRSA08J-102YN	RESISTOR
R78	QRSA08J-183YN	RESISTOR
R79	QRSA08J-472YN	RESISTOR
R80	QRSA08J-822YN	RESISTOR
R81	QRSA08J-392YN	RESISTOR
R82	QRSA08J-562YN	RESISTOR

REF NO.	PART NO.	PART NAME, DESCRIPTION
R83	QRSA08J-103YN	RESISTOR
R84	QRSA08J-333YN	RESISTOR
R85	QRSA08J-113YN	RESISTOR
R86	QRSA08J-472YN	RESISTOR
R87	QRSA08J-104YN	RESISTOR
R88	QRSA08J-184YN	RESISTOR
R89	QRSA08J-472YN	RESISTOR
R90	QRSA08J-472YN	RESISTOR
R91	QRSA08J-562YN	RESISTOR
R92	QRSA08J-122YN	RESISTOR
R93	QRSA08J-152YN	RESISTOR
R94	QRSA08J-331YN	RESISTOR
R95	QRSA08J-332YN	RESISTOR
R96	QRSA08J-122YN	RESISTOR
R97	QRSA08J-471YN	RESISTOR
R98	QRSA08J-152YN	RESISTOR
R99	QRSA08J-105YN	RESISTOR
R100	QRSA08J-105YN	RESISTOR
R101	QRSA08J-561YN	RESISTOR
R102	QRSA08J-561YN	RESISTOR
R103	QRSA08J-331YN	RESISTOR
R104	QRSA08J-102YN	RESISTOR
R105	QRSA08J-222YN	RESISTOR
R106	QRSA08J-822YN	RESISTOR
R109	QRSA08J-103YN	RESISTOR
R110	QRSA08J-332YN	RESISTOR
R111	QRSA08J-103YN	RESISTOR
R112	QRSA08J-105YN	RESISTOR
R113	QRSA08J-105YN	RESISTOR
R114	QRSA08J-821YN	RESISTOR
R115	QRSA08J-471YN	RESISTOR
R117	QRSA08J-471YN	RESISTOR
R122	QRSA08J-562YN	RESISTOR
R123	QRSA08J-222YN	RESISTOR
R124	QRSA08J-222YN	RESISTOR
R125	QRSA08J-102YN	RESISTOR
R126	QRSA08J-223YN	RESISTOR
R127	QRSA08J-103YN	RESISTOR
R128	QRSA08J-183YN	RESISTOR
R129	QRSA08J-684YN	RESISTOR
R130	QRSA08J-684YN	RESISTOR
R131	QRD161J-105	RESISTOR
C1	QEK61HM-105	E CAPACITOR
C2	QEF81CM-474	TANTAL CAPACITOR
C3	QEK61HM-105	E CAPACITOR
C4	QCFA1HZ-473	CAPACITOR
C5	QEK61HM-474	E CAPACITOR
C6	QCYA1HK-102	CAPACITOR
C7	QCYA1HK-103	CAPACITOR
C8	QEK61AM-336	E CAPACITOR
C9	QCYA1HK-102	CAPACITOR
C10	QCYA1HK-103	CAPACITOR
C11	QCYA1HK-103	CAPACITOR
C12	QEK61HM-105	E CAPACITOR
C13	QCYA1HK-103	CAPACITOR
C14	QEK61AM-336	E CAPACITOR
C15	QCYA1HK-103	CAPACITOR
C16	QEK61HM-105	E CAPACITOR
C17	QCYA1HK-103	CAPACITOR
C18	QCSA1HJ-150	CAPACITOR
C19	PU57672-300	TRIMMER CAPACITOR, VCXO
C20	QCSA1HJ-101	CAPACITOR
C21	QCYA1HK-102	CAPACITOR
C22	QEK61HM-105	E CAPACITOR
C23	QCYA1HK-102	CAPACITOR
C24	QEK61HM-224	E CAPACITOR

REF NO. PART NO. PART NAME, DESCRIPTION

C25	QCFA1EZ-683	CAPACITOR
C26	QEK61HM-105	E CAPACITOR
C27	QCTA1CH-681	CAPACITOR
C28	QEK61AM-336	E CAPACITOR
C29	QCYA1HK-103	CAPACITOR
C30	QCFA1EZ-104	CAPACITOR
C31	QCYA1HK-103	CAPACITOR
C32	QCFA1HZ-473	CAPACITOR
C33	QEK61CM-106	E CAPACITOR
C34	QCYA1HK-103	CAPACITOR
C35	QCYA1HK-103	CAPACITOR
C36	QEK61HM-105	E CAPACITOR
C37	QEK61AM-107	E CAPACITOR
C38	QCSA1HJ-8R0	CAPACITOR
C39	QCSA1HJ-180	CAPACITOR
C40	QCYA1HK-103	CAPACITOR
C41	QCFA1HZ-473	CAPACITOR
C42	QEK61CM-106	E CAPACITOR
C43	QCYA1HK-103	CAPACITOR
C44	QCYA1HK-103	CAPACITOR
C45	QCYA1HK-103	CAPACITOR
C46	QEK61AM-336	E CAPACITOR
C47	QCYA1HK-103	CAPACITOR
C48	QEK61AM-336	E CAPACITOR
C49	QEK61HM-105	E CAPACITOR
C50	QCFA1HZ-473	CAPACITOR
C51	QCYA1HK-103	CAPACITOR
C52	QEK61HM-105	E CAPACITOR
C53	QEF81CM-474	TANTAL CAPACITOR
C54	QEK61HM-105	E CAPACITOR
C55	QCFA1HZ-473	CAPACITOR
C56	QEK61HM-474	E CAPACITOR
C57	QCYA1HK-103	CAPACITOR
C58	QEK61AM-336	E CAPACITOR
C59	QCYA1HK-102	CAPACITOR
C60	QCYA1HK-103	CAPACITOR
C61	QCYA1HK-103	CAPACITOR
C62	QEK61HM-105	E CAPACITOR
C63	QCYA1HK-103	CAPACITOR
C64	QEK61AM-336	E CAPACITOR
C65	QCYA1HK-103	CAPACITOR
C66	QEK61HM-105	E CAPACITOR
C67	QCYA1HK-103	CAPACITOR
C68	QCSA1HJ-150	CAPACITOR
C69	PU57672-300	TRIMMER CAPACITOR, VCXO
C70	QCSA1HJ-101	CAPACITOR
C71	QCYA1HK-102	CAPACITOR
C72	QCFA1EZ-683	CAPACITOR
C73	QEK61HM-105	E CAPACITOR
C74	QCTA1CH-681	CAPACITOR
C75	QCYA1HK-103	CAPACITOR
C76	QEK61AM-336	E CAPACITOR
C77	QCFA1EZ-104	CAPACITOR
C78	QCTA1UJ-330	CAPACITOR
C79	QCYA1HK-103	CAPACITOR
C80	QCTA1UJ-330	CAPACITOR
C81	QCYA1HK-103	CAPACITOR
C82	QEK61EM-475	E CAPACITOR
C83	QCTA1CH-7R0	CAPACITOR
C84	QCTA1CH-7R0	CAPACITOR
C85	QCYA1HK-103	CAPACITOR
C86	QCYA1HK-103	CAPACITOR
C87	QCYA1HK-102	CAPACITOR
C88	QCYA1HK-103	CAPACITOR
C89	QCYA1HK-103	CAPACITOR
C90	QCSA1HJ-471	CAPACITOR
C91	QEK61CM-106	E CAPACITOR

REF NO. PART NO. PART NAME, DESCRIPTION

C92	QCYA1HK-472	CAPACITOR
C93	QCYA1HK-103	CAPACITOR
C94	QCYA1HK-103	CAPACITOR
C95	QCYA1HK-103	CAPACITOR
C96	QCYA1HK-103	CAPACITOR
C97	QCSA1HJ-471	CAPACITOR
C98	QEK61CM-106	E CAPACITOR
C99	QCYA1HK-472	CAPACITOR
C100	QCYA1HK-103	CAPACITOR
C101	QCYA1HK-103	CAPACITOR
C102	QCYA1HK-103	CAPACITOR
C103	QCYA1HK-103	CAPACITOR
C104	QCYA1HK-103	CAPACITOR
C105	QCYA1HK-103	CAPACITOR
C106	QEK60JM-107	E CAPACITOR
C107	QCYA1HK-103	CAPACITOR
C108	QEK60JM-107	E CAPACITOR
C109	QCYA1HK-103	CAPACITOR
C110	QEK60JM-107	E CAPACITOR
C111	QCYA1HK-103	CAPACITOR
C112	QCYA1HK-103	CAPACITOR
C113	QCYA1HK-103	CAPACITOR
C114	QCYA1HK-103	CAPACITOR
C116	QEK61AM-336	E CAPACITOR
C117	QEK61AM-336	E CAPACITOR
C118	QEK61AM-336	E CAPACITOR
C119	QCYA1HK-103	CAPACITOR
C120	QCTA1CH-470	CAPACITOR
C121	QCTA1CH-101	CAPACITOR
C123	QCYA1HK-103	CAPACITOR
C124	QCYA1HK-103	CAPACITOR
C125	QCSA1HJ-561	CAPACITOR
C126	QCSA1HJ-561	CAPACITOR
C127	QCYA1HK-103	CAPACITOR
C129	QEF80JM-106	TANTAL CAPACITOR
C131	QCYA1HK-103	CAPACITOR
C132	QCTA1CH-271	CAPACITOR
C133	QCTA1CH-470	CAPACITOR
C134	QEF80JM-225	TANTAL CAPACITOR
C137	QEK40JM-227	E CAPACITOR
C138	QEK40JM-227	E CAPACITOR
C139	QEE41AM-336	TANTAL CAPACITOR
C140	QCS11HJ-220	CAPACITOR
L1	PU60480-101J	COIL, 100 MICRO
L2	PU60480-101J	COIL, 100 MICRO
L3	PU60480-4R7K	COIL, 4.7 MICRO
L4	PU60480-150J	COIL, 15 MICRO
LPF1	PU60441	LOW PASS FILTER
LPF2	PU60441	LOW PASS FILTER
LPF3	PU60445	LOW PASS FILTER
BPF1	PU60446-2	BAND PASS FILTER
Δ CF1	PU60440	RESONATOR
LC1	PU59736-223	N FILTER
LC2	PU59736-223	N FILTER
LC28	PU59736-223	N FILTER
LC29	PU59736-223	N FILTER
LC30	PU59736-223	N FILTER
LC31	PU59736-223	N FILTER
LC32	PU59736-223	N FILTER
LC33	PU59736-223	N FILTER
LC34	PU59736-223	N FILTER
LC35	PU59736-223	N FILTER
LC36	PU59736-223	N FILTER

REF NO.	PART NO.	PART NAME, DESCRIPTION
LC37	PU59736-223	N FILTER
LC38	PU59736-223	N FILTER
LC39	PU59736-223	N FILTER
LC40	PU59736-223	N FILTER
X1	PU60438	CRYSTAL RESONATOR
X2	PU60438	CRYSTAL RESONATOR
X3	PU60439	CRYSTAL RESONATOR
TH1	ERT-D2ZFL102S	THERMISTOR
CL1	PU49485-4	WIRE CLAMP, X2
SCW1	SDST3006Z	TAPPING SCREW, X3
SCW2	SDST3004Z	TAPPING SCREW
SLD1	PQ32344-1-1	SHIELD FLAME
SLD2	PQ32342-1-2	SHIELD FLAME
SLD3	PQ32341-1-2	SHIELD FLAME
SPC1	PQM30029-54	SPACER
SHT1	PQ43349	SHEET, X3
-DIGITAL SUB BOARD ASSEMBLY-		
PWBA	PB40026A-02	DIGITAL SUB BOARD ASSY
Q1	DTC144EF	TRANSISTOR
D1	1SS133	DIODE
D2	1SS133	DIODE
D3	1SS133	DIODE
D4	MA27T(A)	DIODE
R1	QRD162J-103	RESISTOR
R2	QRD162J-103	RESISTOR
R3	QRD162J-472	RESISTOR
-CNN BOARD ASSEMBLY-		
PWBA	PB40031A-01	CNN BOARD ASSY
R1	QRD161J-102	RESISTOR
R2	QRD161J-102	RESISTOR
R3	QRD161J-471	RESISTOR
R4	QRD161J-561	RESISTOR
R5	QRD161J-471	RESISTOR
R6	QRD161J-561	RESISTOR
C1	QCZ0126-102	CAPACITOR
C2	QCZ0126-102	CAPACITOR
C3	QCZ0125-101	CAPACITOR
C4	QCZ0125-101	CAPACITOR
C5	QCZ0125-101	CAPACITOR
C6	QCZ0125-101	CAPACITOR
C7	QCZ0125-101	CAPACITOR
C8	QCZ0125-101	CAPACITOR
C9	QCZ0125-101	CAPACITOR
C10	QCZ0125-101	CAPACITOR
C11	QCZ0126-331	CAPACITOR
C12	QCZ0126-331	CAPACITOR
C13	QCZ0126-331	CAPACITOR
C14	QCZ0126-331	CAPACITOR
C15	QCZ0126-331	CAPACITOR
C16	QCZ0126-331	CAPACITOR
C17	QCZ0126-331	CAPACITOR
C18	QCZ0126-331	CAPACITOR
C19	QEK61HM-225	E CAPACITOR
K1	PU60529	BEADS CORE, X18
BKT1	PQ32343-1-1	BRACKET
SCW1	SDST3006Z	TAPPING SCREW, X2

REF NO.	PART NO.	PART NAME, DESCRIPTION
SCW2	SDST3005Z	TAPPING SCREW, X2
SPC1	PQM30029-54	SPACER, X2
CN1	PU58844-14	CAP HOUSING
CN2	PU58844-9	CAP HOUSING
CN3	PU58844-2	CAP HOUSING
-CNN SUB BOARD ASSEMBLY-		
PWBA	PB40032A-01	CNN SUB BOARD ASSY
C1	QCZ0124-331	CAPACITOR
C2	QCZ0124-331	CAPACITOR
C3	QCZ0124-331	CAPACITOR
C4	QCZ0124-331	CAPACITOR
C5	QCZ0124-331	CAPACITOR
C6	QCZ0124-331	CAPACITOR
C7	QCZ0124-331	CAPACITOR
C8	QCZ0124-331	CAPACITOR
C9	QCZ0124-331	CAPACITOR
C10	QCZ0124-331	CAPACITOR
BKT1	PQ43392	BRACKET
SPC1	PQM30029-111	SPACER, X2
CN1	PU58844-2	CAP HOUSING
CN2	PU59555-8	CAP HOUSING
-DIG SUB 2 BOARD ASSEMBLY-		
PWBA	PB20255A	DIG SUB 2 BOARD ASSY
Q13	2SC2412K(RS)	TRANSISTOR
Q14	2SC2412K(RS)	TRANSISTOR
R132	QRSA08J-182YN	RESISTOR
R133	QRSA08J-222YN	RESISTOR
R134	QRSA08J-102YN	RESISTOR
R135	QRSA08J-182YN	RESISTOR
R136	QRSA08J-222YN	RESISTOR
R137	QRSA08J-102YN	RESISTOR
C135	QCYA1HK-102	CAPACITOR
C136	QCYA1HK-102	CAPACITOR
SPC1	PU59915-206	SPACER

* 17. SIGNAL SELECT BOARD ASSEMBLY <16> *		

PWBA	PB30035D	SIG.SEL BOARD ASS'Y
IC3	UPC7805H	IC
C7	QETC1AM-107	E CAPACITOR
C8	QCC31CJ-104	CAPACITOR
C9	QETC1AM-107	E CAPACITOR
C10	QCC31CJ-104	CAPACITOR
C11	QCC31CJ-104	CAPACITOR
C12	QCC31CJ-104	CAPACITOR
HS1	PQ43262	HEAT SINK
SCW1	SDST3006Z	TAPPING SCREW
SCW2	SDST3006Z	TAPPING SCREW

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
	CN3	PU58844-3	CAP HOUSING
	CN5	PU58844-2	CAP HOUSING
	CN6	PU58844-2	CAP HOUSING
	CN7	PU58844-2	CAP HOUSING
	CN8	PU58844-2	CAP HOUSING
	CP1	ICP-F15	CIRCUIT PROTECT

* 18. ON SCREEN BOARD ASSEMBLY <17> *			

	PWBA	PB20170B	ON SCREEN BOARD ASSY
	TP	PU56008	TEST-PIN, X3
	IC1	MB89010A-108	IC
	IC101	M50925-616SP	IC
	Q1	2SA1309R,S	TRANSISTOR
	Q3	2SA1309R,S	TRANSISTOR
	Q5	DTA124ES	TRANSISTOR
	Q7	DTC114ES	TRANSISTOR
	Q8	2SA933S(RS)	TRANSISTOR
	Q9	DTC114ES	TRANSISTOR
	D1	1SS133	DIODE
	D2	LTZ-MR15	LE DIODE
	R1	QRD161J-102	RESISTOR
	R2	QRD161J-102	RESISTOR
	R3	QRD161J-222	RESISTOR
	R4	QRD161J-222	RESISTOR
	R5	QRD161J-472	RESISTOR
	R6	QRD161J-102	RESISTOR
	R7	QRD161J-472	RESISTOR
	R8	QRD161J-472	RESISTOR
	R9	QRD161J-472	RESISTOR
	R10	QRD161J-472	RESISTOR
	R11	QRD161J-472	RESISTOR
	R14	QRD161J-471	RESISTOR
	R15	QRD161J-154	RESISTOR
	R17	QRD161J-104	RESISTOR
	R18	QRD161J-681	RESISTOR
	R19	QRD161J-681	RESISTOR
	R20	QRD161J-472	RESISTOR
	R22	QRD161J-222	RESISTOR
	R25	QRD161J-474	RESISTOR
	R26	QRD161J-103	RESISTOR
	R27	QRD161J-103	RESISTOR
	R28	QRD161J-102	RESISTOR
	R29	QRD161J-102	RESISTOR
	R30	QRD161J-222	RESISTOR
	R38	QRD161J-152	RESISTOR
	R39	QRD161J-222	RESISTOR
	R109	QRD161J-472	RESISTOR
	R110	QRD161J-472	RESISTOR
	R111	QRD161J-472	RESISTOR
	R112	QRD161J-332	RESISTOR
	R113	QRD161J-105	RESISTOR
	R114	QRD161J-472	RESISTOR
	R115	QRD161J-472	RESISTOR
	R116	QRD161J-472	RESISTOR
	R117	QRD161J-103	RESISTOR
	R118	QRD161J-103	RESISTOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C1	QCSB1HJ-150	CAPACITOR
	C3	QCSB1HJ-330	CAPACITOR
	C4	PU57672-400	TRIMMER CAPACITOR, DOT CLK ADJ
	C5	QEK61CM-106	E CAPACITOR
	C7	QER61EM-335	E CAPACITOR
	C8	QCB81HJ-331	CAPACITOR
	C14	PU57672-300	TRIMMER CAPACITOR, COL CLK ADJ
	C15	QCVB1CN-103	CAPACITOR
	C16	PU57601-335MC	E CAPACITOR
	C17	QCVB1CN-103	CAPACITOR
	C18	QET60JM-107	E CAPACITOR
	C19	QCF11HP-473	CAPACITOR
	C20	QCSB1HJ-560	CAPACITOR
	C101	QCB81HJ-101	CAPACITOR
	C102	QCB81HJ-101	CAPACITOR
	C103	QCC11EK-473	CAPACITOR
	L1	PU58333-180K	PEAKING COIL, 18 MICRO
	L3	PU48530-101J	PEAKING COIL, 100 MICRO
	Δ CF101	PU60196	RESONETOR
	Δ X1	PU59965	CRYSTAL RESONATOR
	CN101	PU58844-4	CAP HOUSING
	CN102	PU58844-10	CAP HOUSING

* 19. TIMER BOARD ASSEMBLY <20> *			

	PWBA	PB20171C	TIMER BOARD ASS'Y
	IC1	M50959-616SP	IC
	IC2	M58658P	IC
	IC3	UPC393C	IC
	IC4	S-8053HLB	IC
	Δ Q1	2SC3311A(RS)	TRANSISTOR
	Q2	2SC1685R,S	TRANSISTOR
	Q3	2SC3311A(RS)	TRANSISTOR
	D1	1SS133	DIODE
	D2	1SS133	DIODE
	D3	RD5.6ES-T1B3	ZENER DIODE
	D5	1SS132	DIODE
	Δ D6	RD9.1ES-T1B2	ZENER DIODE
	D7	1SS133	DIODE
	D8	1SS132	DIODE
	R1	QRD161J-122	RESISTOR
	R2	QRD161J-102	RESISTOR
	R3	QRD161J-472	RESISTOR
	R4	QRD161J-474	RESISTOR
	R5	QRD161J-334	RESISTOR
	R6	QRD161J-475	RESISTOR
	R7	QRD161J-105	RESISTOR
	R8	QRD161J-472	RESISTOR
	R9	QRD161J-682	RESISTOR
	R10	QRD161J-104	RESISTOR
	R11	QRD161J-103	RESISTOR
	R12	QRD161J-471	RESISTOR
	R13	QRD161J-473	RESISTOR
	R15	QRD161J-473	RESISTOR
	R16	QRD161J-474	RESISTOR
	R17	QRD161J-103	RESISTOR

REF NO.	PART NO.	PART NAME, DESCRIPTION
R18	QRD161J-103	RESISTOR
R19	QRD161J-472	RESISTOR
R20	QRD161J-472	RESISTOR
R21	QRD161J-472	RESISTOR
R22	QRD161J-222	RESISTOR
R23	QRD161J-684	RESISTOR
R24	QRD161J-474	RESISTOR
R33	QRD161J-104	RESISTOR
R34	QRD161J-102	RESISTOR
R38	QRD161J-472	RESISTOR
R39	QRD161J-472	RESISTOR
R40	QRD161J-472	RESISTOR
R41	QRD161J-224	RESISTOR
R42	QRD161J-472	RESISTOR
R43	QRD161J-472	RESISTOR
R44	QRD161J-472	RESISTOR
R45	QRD161J-472	RESISTOR
R46	QRD161J-472	RESISTOR
R47	QRD161J-472	RESISTOR
R48	QRD161J-472	RESISTOR
R49	QRD161J-472	RESISTOR
R50	QRD161J-472	RESISTOR
R51	QRD161J-472	RESISTOR
R52	QRD161J-472	RESISTOR
R53	QRD161J-472	RESISTOR
R54	QRD161J-472	RESISTOR
R55	QRD161J-472	RESISTOR
R56	QRD161J-472	RESISTOR
R57	QRD161J-472	RESISTOR
R58	QRD161J-472	RESISTOR
R59	QRD161J-472	RESISTOR
R61	QRD161J-472	RESISTOR
R62	QRD161J-472	RESISTOR
R63	QRD161J-472	RESISTOR
R64	QRD161J-472	RESISTOR
R65	QRD161J-472	RESISTOR
R66	QRD161J-472	RESISTOR
R67	QRD161J-102	RESISTOR
R68	QRD161J-224	RESISTOR
R69	QRD161J-102	RESISTOR
R70	QRD161J-472	RESISTOR
R71	QRD161J-472	RESISTOR
RA1	QRB047J-104	RESISTOR ARRAY
OR	QRB049J-104	RESISTOR ARRAY
RA2	QRB047J-224	RESISTOR NETWORK
OR	QRB049J-224	RESISTOR NETWORK
RA3	QRB037J-223	RESISTOR NETWORK
OR	QRB039J-223	RESISTOR NETWORK
RA5	QRB047J-222	RESISTOR NETWORK
OR	QRB049J-222	RESISTOR ARRAY
C1	QEK61CM-336	E CAPACITOR
C2	QEK61CM-106	E CAPACITOR
C3	QEK60JM-476	E CAPACITOR
C4	PU59421-104	E CAPACITOR
C5	QEK60JM-476	E CAPACITOR
C6	QCF31HP-103	CAPACITOR
C7	QEK61CM-106	E CAPACITOR
C8	QCS31HJ-330	CAPACITOR
C9	PU57672-400	TRIMMER CAPACITOR, TIMER CLOCK
C10	QCC11EJ-104	CAPACITOR
C12	QCF31HP-102	CAPACITOR
C13	QCF31HP-103	CAPACITOR
C15	QCB81HJ-102	CAPACITOR
CF1	PU58428	RESONATOR

REF NO.	PART NO.	PART NAME, DESCRIPTION
OR	PU59576	RESONATOR
X1	PU58394	CRYSTAL RESONATOR
SPC1	PU59210-001	W.LOKING SPACER, X2
TP1	PU56008	TEST-PIN
TP2	PU56008	TEST-PIN
TP3	PU56008	TEST-PIN
TP4	PU56008	TEST-PIN
TP5	PU56008	TEST-PIN
CN1	PU58844-4	CAP HOUSING
CN2	PU60417-8	CAP HOUSING
CN3	PU60417-6	CAP HOUSING
CN4	PU58844-102R	CAP HOUSING
CN5	PU60417-105	CAP HOUSING
CN6	PU58844-103	CAP HOUSING
CN9	PU58798-114	FPC CONNECTER
CN11	PU59555-102	CAP HOUSING

* 20. CONTROL BOARD ASSY <24> *		

PWBA	PB10107A	CONTROL BOARD ASSY
D401	1SS133	DIODE
D402	1SS133	DIODE
D403	1SS133	DIODE
D404	1SS133	DIODE
D409	1SS133	DIODE
R211	QRD161J-222	RESISTOR
R212	QRD161J-222	RESISTOR
R213	QRD161J-332	RESISTOR
R214	QRD161J-472	RESISTOR
R215	QRD161J-103	RESISTOR
R216	QRD161J-223	RESISTOR
R217	QRD161J-222	RESISTOR
R218	QRD161J-222	RESISTOR
R219	QRD161J-332	RESISTOR
R220	QRD161J-472	RESISTOR
R221	QRD161J-103	RESISTOR
R222	QRD161J-223	RESISTOR
R227	QRD161J-103	RESISTOR
R228	QRD161J-223	RESISTOR
R229	QRD161J-472	RESISTOR
R401	PU60390	V RESISTOR, V. LOCK
R402	PU59092-12	V RESISTOR, P. SHARPNESS
R403	PU59092-2	V RESISTOR, PHONES LEVEL
R404	PU59092-1	SLIDE VOLUME, REC LEVEL (L) (R)
S1	PU59092-14	TACT SWITCH, 1/SUN
S2	PU59092-14	TACT SWITCH, 2/MON
S3	PU59092-14	TACT SWITCH, 3/TUE
S4	PU59092-14	TACT SWITCH, 4/WED
S5	PU59092-14	TACT SWITCH, 5/THU
S6	PU59092-14	TACT SWITCH, 6/FRI
S7	PU59092-14	TACT SWITCH, 7/SAT
S8	PU59092-14	TACT SWITCH, 8/1ST/2ND
S9	PU59092-14	TACT SWITCH, 9/DAILY
S10	PU59092-14	TACT SWITCH, 0/REPEAT
S11	PU59092-14	TACT SWITCH, GO-TO
S12	PU59092-14	TACT SWITCH, ENTER
S13	PU59092-14	TACT SWITCH, COUNTER RESET

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
S14		PU59092-14	TACT SWITCH, CH UP
S15		PU59092-14	TACT SWITCH, REC/OTR
S16		PU59092-14	TACT SWITCH, SP/EP
S17		PU59092-14	TACT SWITCH, DISPLAY
S18		PU59092-14	TACT SWITCH, CH DOWN
S19		PU59092-14	TACT SWITCH, SAP REC
S21		PU59092-14	TACT SWITCH, CLOCK ADJ
S22		PU59092-14	TACT SWITCH, PROGRAM
S23		PU59092-14	TACT SWITCH, TIMER
S24		PU59092-14	TACT SWITCH, CANCEL/SKIP
S26		PU59092-14	TACT SWITCH, ON SCREEN
S27		PU59092-14	TACT SWITCH, AM/PM/SC
S201		PU59092-14	TACT SWITCH, STOP
S202		PU59092-14	TACT SWITCH, PAUSE/STILL
S203		PU59092-14	TACT SWITCH, PLAY/X2
S204		PU59092-14	TACT SWITCH, REW
S205		PU59092-14	TACT SWITCH, FF
S206		PU59092-14	TACT SWITCH, VAR. SEARCH (REW)
S207		PU59092-14	TACT SWITCH, VAR. SEARCH (FWD)
S208		PU59092-14	TACT SWITCH, AUDIO DUB
S209		PU59092-14	TACT SWITCH, INSERT
S211		PU59092-14	TACT SWITCH, ERASE
S212		PU59092-14	TACT SWITCH, TRACKING -
S213		PU59092-14	TACT SWITCH, MARK
S214		PU59092-14	TACT SWITCH, INDEX
S220		PU59092-14	TACT SWITCH, AUDIO MONITOR
S221		PU59092-14	TACT SWITCH, TRACKING +
S222		PU59092-14	TACT SWITCH, S-MODE
S401		PU59092-6	SWITCH, SOURCE SELECT
S402		PU54440	SWITCH, COUNT MEMORY
S403		PU54440	SWITCH, AFC
S404		QSS1A13-L01	SWITCH, BAND
S405		PU54440	SWITCH, EDIT
S406		PU59092-6	SWITCH, LEVEL INDICATOR
S407		PU54440	SWITCH, ALC
S408		PU54440	SWITCH, AC ONLINE
S409		PU54440	SWITCH, AUTO TITLE
S410		PU54440	SWITCH, VIDEO IN SELECT
SPC1		PQM30029-104	SPACER
SPC2		PQM30029-105	SPACER
WR1		PU36448-3	FLAT WIRE
WR2		PU60382-1-3	FPC

* 21. POWER SWITCH / LED BOARD ASSY <25><32>*			

PWBA	PB20193A-01		POWER SWITCH/LED BOARD ASS'Y
-POWER SWITCH BOARD ASSEMBLY < 25 >-			
PWBA1	PB20193A1-01		P.SW BOARD ASS'Y
IC1	GP1U501		INFRATED RAYS UNIT
	OR SPS-413		INFRARED RAYS U
Q201	DTC114EF		TRANSISTOR
Q202	DTC114EF		TRANSISTOR
D1	SLV-31MC3F		LE DIODE
D2	SLV-31MC3F		LE DIODE
D201	1SS133		DIODE

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
R1		QRD161J-181	RESISTOR
R2		QRD161J-223	RESISTOR
R3		QRD161J-332	RESISTOR
R4		QRD161J-222	RESISTOR
R5		QRD161J-222	RESISTOR
R6		QRD161J-471	RESISTOR
R7		QRD161J-181	RESISTOR
R201		QRD161J-223	RESISTOR
C1		QET61AM-476	E CAPACITOR
C201		QCBBIHJ-102	CAPACITOR
S1		PU57551	TACT SWITCH
S2		PU57551	TACT SWITCH
S3		PU57551	TACT SWITCH
J1		PU58356-2	JACK(HEADPHONE)
J2		PU58355-2	MIC JACK
SLD1		PQ31764	SHADE (LED)
CN201		PU59513-6	CAP HOUSING
-LED BOARD ASSEMBLY < 32 >-			
PWBA2	PB20193A2		LED BOARD ASS'Y
Q1	DTC144EF		TRANSISTOR
D203	SLR-37VR3F		LE DIODE
D204	SLR-37VR3F		LE DIODE
D205	SLR-37VR3F		LE DIODE
D206	SLR-37VR3F		LE DIODE
D211	SLR-37VR3F		LE DIODE
D212	SLR-37VR3F		LE DIODE
D213	SLR-37VR3F		LE DIODE
D214	SLR-37VR3F		LE DIODE
D215	GL-3EG43		LE DIODE
D216	GL-3EG43		LE DIODE
D217	GL-3EG43		LE DIODE
D218	GL-3EG43		LE DIODE
D219	GL-3EG43		LE DIODE
D220	GL-3EG43		LE DIODE
D221	GL-3EG43		LE DIODE
D222	GL-3EG43		LE DIODE
D223	GL-3EG43		LE DIODE
D224	GL-3EG43		LE DIODE
D225	GL-3EG43		LE DIODE
D227	GL-3EG43		LE DIODE
D228	GL-3EG43		LE DIODE
D229	GL-3EG43		LE DIODE
D230	GL-3EG43		LE DIODE
D231	GL-3EG43		LE DIODE
R101	QRD161J-271		RESISTOR
R102	QRD161J-561		RESISTOR
R103	QRD161J-561		RESISTOR
R104	QRD161J-331		RESISTOR
R105	QRD161J-331		RESISTOR
R106	QRD161J-821		RESISTOR
R107	QRD161J-331		RESISTOR
R108	QRD161J-223		RESISTOR
SLD2	PQ20548-2		SHADE(LED)

REF NO.	PART NO.	PART NAME, DESCRIPTION
***** * 22. DISPLAY BOARD ASSEMBLY <27> *		

PWBA	PB20177B	DISPLAY BOARD ASS'Y
IC101	MSC7110-01SS	IC
IC102	MSC1124BRS	IC
Q1	DTC144EF	TRANSISTOR
Q2	DTC144ES	TRANSISTOR
Q3	2SA1309R,S	TRANSISTOR
Q102	DTC124ES	TRANSISTOR
Q103	DTA114ES	TRANSISTOR
D102	1SS132	DIODE
D103	1SS132	DIODE
D104	RD8.2ES-T1B2	ZENER DIODE
D105	1SS132	DIODE
D106	RD3.0ES-T1B2	ZENER DIODE
D107	RD24ES-T1B2	ZENER DIODE
D207	SLH-34VC3F	LE DIODE
D208	SLH-34VC3F	LE DIODE
D209	SLH-34VC3F	LE DIODE
D210	SLH-34VC3F	LE DIODE
R1	QRD161J-331	RESISTOR
R2	QRD161J-331	RESISTOR
R3	QRD161J-103	RESISTOR
R4	QRD161J-473	RESISTOR
R101	QRD161J-103	RESISTOR
R107	QRD161J-393	RESISTOR
R108	QRD161J-333	RESISTOR
R111	QRD161J-104	RESISTOR
R112	QRD161J-103	RESISTOR
R113	QRD161J-151	RESISTOR
R114	QRD161J-104	RESISTOR
R115	QRD161J-103	RESISTOR
R116	QRD161J-151	RESISTOR
R117	QRD161J-103	RESISTOR
R118	QRD161J-103	RESISTOR
R119	QRD161J-103	RESISTOR
R209	QRD161J-181	RESISTOR
R210	QRD161J-181	RESISTOR
RA101	QRB037J-472	RESISTOR NETWORK
C101	QCC11EJ-473	CAPACITOR
C102	QER61HM-104	E CAPACITOR
C103	QCB81HJ-101	CAPACITOR
C104	QER61HM-105	E CAPACITOR
C105	QER61HM-475	E CAPACITOR
C106	QER61HM-225	E CAPACITOR
C107	QFJ41HJ-223	M CAPACITOR
C108	QER61CM-106	E CAPACITOR
C109	QER61CM-106	E CAPACITOR
C110	QEK60JM-227	E CAPACITOR
C111	QCF31HP-473	CAPACITOR
C112	QCF31HP-223	CAPACITOR
C113	QER41VM-106	E CAPACITOR
FDP1	PU59952	FLUORESCENT DISPLAY PANEL
HD1	PQ43223	LED HOLDER
HD2	PQ31309	FDP HOLDER (L)
HD3	PQ31310	FDP HOLDER (R)

REF NO.	PART NO.	PART NAME, DESCRIPTION
CN5	PU59513-4	CAP HOUSING
CN6	PU59555-103	CAP HOUSING

***** * 23. STEP BOARD ASSEMBLY <37> *		

PWBA	PB30052A-01	STEP BOARD ASS'Y
D1	1SS133	DIODE
D2	1SS133	DIODE
D3	1SS133	DIODE
D4	1SS133	DIODE
R1	QRD162J-152	RESISTOR
R2	QRD162J-332	RESISTOR
R3	QRD162J-103	RESISTOR
R4	QRD162J-103	RESISTOR
CN1	PU58798-126	FFC CONNECTOR
CN7	PU58844-3Y	CAP HOUSING

***** * 24. UPPER DRUM BOARD <41> *		

PWB1	PDM3161	UPPER DRUM BOARD,X2

***** * 25. PRE/REC AMP BOARD ASSEMBLY <43> *		

PWBA	PB10079A-01	PRE/REC AMP BOARD ASS'Y
IC1	HA118019NT	IC
IC2	VC2034	IC
OR	VC2034-2	IC
IC3	AN6392	IC
IC4	BU4030BF	IC
Q1	2SC2412K	TRANSISTOR
Q2	2SC2412K	TRANSISTOR
Q11	2SA1037K	TRANSISTOR
Q12	2SA1037K	TRANSISTOR
Q13	DTC144EK	TRANSISTOR
Q14	DTC144WK	TRANSISTOR
Q15	DTA124EK	TRANSISTOR
Q16	DTC144EK	TRANSISTOR
Q17	DTA124EK	TRANSISTOR
Q21	DTC124EK	TRANSISTOR
Q101	2SC2412K	TRANSISTOR
Q102	2SA1037K	TRANSISTOR
Q103	2SC2412K	TRANSISTOR
Q104	2SC2412K	TRANSISTOR
Q105	2SC2412K	TRANSISTOR
Q106	2SC2412K	TRANSISTOR
Q107	2SA1037K	TRANSISTOR
Q108	2SC2412K	TRANSISTOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION	#	REF NO.	PART NO.	PART NAME, DESCRIPTION
	Q109	2SC2412K	TRANSISTOR		R110	QRSA08J-102YN	RESISTOR
	Q110	2SA1037K	TRANSISTOR		R111	QRSA08J-223YN	RESISTOR
	Q111	2SC2412K	TRANSISTOR		R112	QRSA08J-333YN	RESISTOR
	Q112	2SC2412K	TRANSISTOR		R113	QRSA08J-681YN	RESISTOR
	D1	1SS133	DIODE		R114	QRSA08J-103YN	RESISTOR
	D2	1SS133	DIODE		R115	QRSA08J-393YN	RESISTOR
	D5	DAN202K	DIODE		R116	QRSA08J-153YN	RESISTOR
	D6	DAN202K	DIODE		R117	QRSA08J-153YN	RESISTOR
	D7	1SS133	DIODE		R118	QVZ3521-222	V RESISTOR, SP PB EQ (S-MODE)
	D8	1SS133	DIODE		R119	QRSA08J-102YN	RESISTOR
	D101	1SS133	DIODE		R120	QRSA08J-102YN	RESISTOR
	D102	1SS133	DIODE		R121	QRSA08J-561YN	RESISTOR
	D103	1SS133	DIODE		R122	QRSA08J-561YN	RESISTOR
	D104	1SS133	DIODE		R123	QRSA08J-122YN	RESISTOR
	R1	QRSA08J-122YN	RESISTOR		R124	QRSA08J-561YN	RESISTOR
	R2	QRSA08J-122YN	RESISTOR		R125	QRSA08J-122YN	RESISTOR
	R3	QRSA08J-560YN	RESISTOR		R126	QRSA08J-102YN	RESISTOR
	R4	QRSA08J-560YN	RESISTOR		R128	QRSA08J-273YN	RESISTOR
	R5	QRSA08J-180YN	RESISTOR		R129	QRSA08J-102YN	RESISTOR
	R6	QRSA08J-390YN	RESISTOR		R130	QRSA08J-561YN	RESISTOR
	R7	QRSA08J-103YN	RESISTOR		R131	QRSA08J-821YN	RESISTOR
	R8	QRSA08J-474YN	RESISTOR		R132	QRSA08J-681YN	RESISTOR
	R9	QRSA08J-122YN	RESISTOR		R133	QRSA08J-681YN	RESISTOR
	R10	QRSA08J-122YN	RESISTOR		R134	QRSA08J-821YN	RESISTOR
	R11	QRSA08J-334YN	RESISTOR		R135	QRSA08J-561YN	RESISTOR
	R12	QRSA08J-223YN	RESISTOR		R136	QRSA08J-471YN	RESISTOR
	R13	QRSA08J-223YN	RESISTOR		R137	QRSA08J-102YN	RESISTOR
	R16	QRSA08J-223YN	RESISTOR		R138	QRSA08J-333YN	RESISTOR
	R29	QRSA08J-333YN	RESISTOR		R139	QRSA08J-223YN	RESISTOR
	R45	QRSA08J-271YN	RESISTOR		C3	QCFA1HZ-103	CAPACITOR
	R46	QRSA08J-102YN	RESISTOR		C4	QCFA1HZ-103	CAPACITOR
	R47	QRSA08J-102YN	RESISTOR		C5	QETC0JM-476	E CAPACITOR
	R50	QRSA08J-623YN	RESISTOR		C6	QCY81EK-223ZL	CAPACITOR
	R51	QRSA08J-271YN	RESISTOR		C7	QCYA1HK-152	CAPACITOR
	R52	QRSA08J-121YN	RESISTOR		C10	PU59758-105	CAPACITOR
	R53	QRSA08J-102YN	RESISTOR		C11	PU59758-105	CAPACITOR
	R54	QRSA08J-223YN	RESISTOR		C14	QCYA1HK-152	CAPACITOR
	R55	QRSA08J-183YN	RESISTOR		C15	QCYA1HK-152	CAPACITOR
	R56	QRSA08J-273YN	RESISTOR		C16	QCSA1HJ-471	CAPACITOR
	R57	QRSA08J-222YN	RESISTOR		C18	PU59758-105	CAPACITOR
	R58	QRSA08J-821YN	RESISTOR		C19	PU59758-105	CAPACITOR
	R59	QRSA08J-222YN	RESISTOR		C21	QCSA1HJ-121	CAPACITOR
	R60	QRSA08J-103YN	RESISTOR		C22	QCYA1HK-152	CAPACITOR
	R61	QRSA08J-103YN	RESISTOR		C24	QCFA1HZ-103	CAPACITOR
	R68	QRSA08J-393YN	RESISTOR		C25	QETC1HM-104	E CAPACITOR
	R69	QRSA08J-393YN	RESISTOR		C26	QCFA1HZ-103	CAPACITOR
	R71	QRSA08J-104YN	RESISTOR		C27	QCSA1HJ-121	CAPACITOR
	R72	QRSA08J-102YN	RESISTOR		C28	QCSA1HJ-331	CAPACITOR
	R73	PU52108-150	POSISTOR		C29	QCSA1HJ-391	CAPACITOR
	R74	OR PU52108-150T	POSISTOR		C31	QETC0JM-476	E CAPACITOR
	R74	OR PU52108-2R2	POSISTOR		C32	QCFA1HZ-103	CAPACITOR
	R75	QRD182J-183	RESISTOR		C39	QER61EM-475	E CAPACITOR
	R76	QRD161J-822	RESISTOR		C41	QER60JM-476	E CAPACITOR
	R101	QVZ3521-222	V RESISTOR, EP PB EQ (S-MODE)		C50	QCFA1HZ-103	CAPACITOR
	R102	QRSA08J-102YN	RESISTOR		C51	QCFA1HZ-103	CAPACITOR
	R103	QRSA08J-102YN	RESISTOR		C52	QCFA1HZ-103	CAPACITOR
	R104	QRSA08J-561YN	RESISTOR		C53	QETC1CM-476	E CAPACITOR
	R105	QRSA08J-561YN	RESISTOR		C54	QFN31HJ-223	M CAPACITOR
	R106	QRSA08J-182YN	RESISTOR		C55	QCC11EJ-103	CAPACITOR
	R107	QRSA08J-561YN	RESISTOR		C56	QETC1HM-105	E CAPACITOR
	R108	QRSA08J-392YN	RESISTOR		C57	QCSA1HJ-470	CAPACITOR
	R109	QRSA08J-471YN	RESISTOR		C58	QCFA1HZ-103	CAPACITOR
					C59	QCFA1HZ-103	CAPACITOR
					C61	QETA1AM-476	E CAPACITOR

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C101	QCSA1HJ-270	CAPACITOR
	C103	QCSA1HJ-390	CAPACITOR
	C104	QCSA1HJ-150	CAPACITOR
	C105	QCSA1HJ-390	CAPACITOR
	C106	QCSA1HJ-180	CAPACITOR
	C108	QCSA1HJ-820	CAPACITOR
	C109	QCSA1HJ-820	CAPACITOR
	C110	QCFA1HZ-103	CAPACITOR
	C111	QCFA1HZ-103	CAPACITOR
	C112	QCSA1HJ-270	CAPACITOR
	C113	QCSA1HJ-470	CAPACITOR
	C115	QCSA1HJ-180	CAPACITOR
	C116	QCSA1HJ-120	CAPACITOR
	C117	QCSA1HJ-180	CAPACITOR
	C118	QCSA1HJ-101	CAPACITOR
	C119	QCSA1HJ-121	CAPACITOR
	C120	QCSA1HJ-330	CAPACITOR
	C122	QCSA1HJ-330	CAPACITOR
	C123	QCSA1HJ-120	CAPACITOR
	C124	QCSA1HJ-220	CAPACITOR
	C125	QCFA1HZ-103	CAPACITOR
	C126	QCFA1HZ-103	CAPACITOR
	C127	QCFA1HZ-103	CAPACITOR
	C130	QCSA1HJ-470	CAPACITOR
	C131	QCSA1HJ-470	CAPACITOR
	L1	PU48530-101K	PEAKING COIL, 100 MICRO
	L2	PU59152-330J	PEAKING COIL, 33 MICRO
	L3	PU59152-181J	PEAKING COIL, 180 MICRO
	L4	PU48530-101K	PEAKING COIL, 100 MICRO
	L6	PU48530-101K	PEAKING COIL, 100 MICRO
	L15	PU59153-101K	INDUCTOR, 100 MICRO
	L16	PU59152-100J	PEAKING COIL, 10 MICRO
	L101	PU59152-470J	PEAKING COIL, 47 MICRO
	L102	PU59152-120J	PEAKING COIL, 12 MICRO
	L103	PU59152-390J	PEAKING COIL, 39 MICRO
	L104	PU59152-221J	PEAKING COIL, 220 MICRO
	L105	PU59152-100J	PEAKING COIL, 10 MICRO
	L106	PU59152-470J	PEAKING COIL, 47 MICRO
	L107	PU59152-120J	PEAKING COIL, 12 MICRO
	L108	PU59152-330J	PEAKING COIL, 33 MICRO
	L109	PU59152-100J	PEAKING COIL, 10 MICRO
	L110	PU59152-150J	PEAKING COIL, 15 MICRO
	L111	PU59152-330J	PEAKING COIL, 33 MICRO
	L112	PU59152-220J	PEAKING COIL, 22 MICRO
	L113	PU59152-390J	PEAKING COIL, 39 MICRO
	BKT1	PQ42955	BOARD BRACKET
	ETH1	PQ40433-2	EARTH LUG
	ETH2	PQ43375-1-1	EARTH PLATE
	SCW1	DPSP2606Z	SCREW, X2
	SCW2	DPSP2606Z	SCREW
	SLD1	PQ43376A-1	SHIELD CASE
	SLD2	PU60154	SHIELD PLATE
	SLD3	PU60153-2-1	SHIELD CASE
	SPC1	PU59210-001	W.LOKING SPACER, X3
	SPC2	WBS2600Z	T.L.WASHER
	WR1	PW30109-50AAZZ7	PARALLEL WIRE
	TP	PU56008	TEST-PIN, X3
	CN1	PU56258-10	CAP HOUSING

#	REF NO.	PART NO.	PART NAME, DESCRIPTION
	CN2	PU58844-4	CAP HOUSING
	CN3	PU58844-2	CAP HOUSING
	CN4	PU58844-4	CAP HOUSING
	CN5	PU58844-9	CAP HOUSING

* 26. FLYING ERASE BOARD ASSEMBLY <46> *			

	PWBA	PB30045A	FLYING ERASE BOARD ASSY
	Q1	2SA933S	TRANSISTOR
	Q2	2SC1741S(QR)	TRANSISTOR
	Q3	2SA933S	TRANSISTOR
	Q4	2SD639R	TRANSISTOR
	Q5	2SD639R	TRANSISTOR
	D1	UZ8.2BSC	ZENER DIODE
	D2	1SS133	DIODE
	R1	QRD161J-473	RESISTOR
	R2	QRD161J-472	RESISTOR
	R3	QRD161J-222	RESISTOR
	R4	QRD161J-473	RESISTOR
	R5	QRD161J-472	RESISTOR
	R6	QRD161J-104	RESISTOR
	R7	QRD161J-121	RESISTOR
	R8	QRD161J-104	RESISTOR
	R9	QRD161J-121	RESISTOR
	C1	QCVB1CN-103	CAPACITOR
	C2	QCC11EJ-123	CAPACITOR
	C3	QCSB1HJ-560	CAPACITOR
	C4	QCB81HJ-820	CAPACITOR
	C6	QCB81HJ-820	CAPACITOR
	C8	QCT25UJ-181	CAPACITOR
	C9	QCT05UJ-330	CAPACITOR
	L1	PU48530-560J	PEAKING COIL, 56 MICRO
	L2	PU48530-3R3K	PEAKING COIL, 3.3 MICRO
	L3	PU48530-3R3K	PEAKING COIL, 3.3 MICRO
	L4	PU59152-101J	PEAKING COIL, 100 MICRO
	T1	PU56175	S.TRANS
	SLD1	PU60408	SHIELD CASE
	SLD2	PU60409	SHIELD COVER
	SLD3	PU60410	SHIELD PLATE
	CN1	PU58844-3	CAP HOUSING
	CN2	PU58844-2	CAP HOUSING
	CN3	PU58844-2	CAP HOUSING

* 27. SYNC SEP/SUB SERVO BOARD ASSEMBLY <49> *			

	PWBA	PB30060B	SYNC SEP/SUB SERVO BOARD ASSY
-SYNC SEP SECTION-			
	IC1	M52684P	IC
		OR M52684AP	IC
	IC2	BU4013B	IC
		OR TC4013BP	IC

#A	REF NO.	PART NO.	PART NAME, DESCRIPTION
	Q1	DTC114ES	TRANSISTOR
	R1	QRD161J-152	RESISTOR
	R2	QRD161J-271	RESISTOR
	R3	QRD161J-103	RESISTOR
	R4	QRD161J-103	RESISTOR
	C1	QER61HM-105	E CAPACITOR
	C2	QER61CM-106	E CAPACITOR
	C3	QCSB1HJ-220	CAPACITOR
	C4	QCXB1CN-152	CAPACITOR
	C5	QCVB1CM-103	CAPACITOR
	C6	QCVB1CM-103	CAPACITOR
	C7	QFN31HJ-222	M CAPACITOR
	C9	QCVB1CM-103	CAPACITOR
A	CF1	PU60086	RESONATOR
	CN1	PU58844-5	CAP HOUSING
-SUB SERVO SECTION-			
	Q102	DTC124ES	TRANSISTOR
	CN101	PU58844-2Y	CAP HOUSING
	CN103	PU58844-2R	CAP HOUSING
	CN105	PU58844-2Y	CAP HOUSING

* 28. DECK TERMINAL BOARD ASSEMBLY <51><53> *			

PWBA	PB20013C-03		DECK TERMINAL BOARD ASSEMBLY
-DECK TERMINAL BOARD ASSEMBLY <51>-			
PWBA1	PB20013C1		DECK TERMINAL BOARD ASSY
	R1	QRD181J-151	C RESISTOR
	R3	QRD181J-331	C RESISTOR
	PHS1	PU60271	P. INTERRUPTER
	CN1	PU59933-17	WIRE TRAP
-REC SAFETY BOARD ASSEMBLY <53>-			
PWBA3	PB20013A3		REC SAFETY BOARD ASSY
	S1	PU58644-1-3	REC SAFETY SWITCH

* 29. RELAY BOARD ASSEMBLY <52> *			

PWBA2	PB20013A2		RELAY BOARD ASSY
	LC1	PU59736-223	N FILTER
	LC2	PU59736-223	N FILTER
	WR2	PW30113-GOABZ62	PARALLEL WIRE

* 30. END SENSOR BOARD ASSEMBLY <54> *			

PWBA4	PB20013A4		END SENSOR BOARD ASSY
	Q1	PN268R-NC	PHOTO TRANSISTOR
	HD1	PQ31047	END SENSOR HOLDER
	CN1	PU59945-102	WIRE SOCKET

#A	REF NO.	PART NO.	PART NAME, DESCRIPTION

* 31. CASSETTE HOUSING BOARD <56> *			

PWB1	PB30043		CASSETTE HOUSING BOARD
	Q1	PN268R-NC	PHOTO TRANSISTOR
	R1	QRD161J-471	RESISTOR
	PHS1	PU58879	PHOTO INTERRUPTER
	CN1	PU58844-106	CAP HOUSING

* 32. REMOTE CONTROL BOARD ASSEMBLY <RM> *			

PWB A	PQ10607-1		REMOCON BOARD ASSY
	IC1	M50565-014FP	IC
	Q1	2SD601R,T,W	CHIP TRANSISTOR
	Q2	2SA822(RS)	CHIP TRANSISTOR
	D1	SE303A4	LE DIODE
	D2	SE303A4	LE DIODE
	D3	MA151A	DIODE, (1/2)
	D4	MA151A	DIODE, (1/2)
	D5	MA151A	DIODE, (1/2)
	D6	MA151A	DIODE, (1/2)
	D7	MA151A	DIODE, (1/2)
	D8	MA151A	DIODE, (1/2)
	D9	MA151A	DIODE, (1/2)
	D10	MA151A	DIODE, (1/2)
	D11	MA151WK	DIODE, (1/2)
	D12	MA151WK	DIODE, (1/2)
	D13	MA151WK	DIODE, (1/2)
	D14	MA151WK	DIODE, (1/2)
	D15	MA151WK	DIODE, (1/2)
	D16	MA151WK	DIODE, (1/2)
	D17	MA151WK	DIODE, (1/2)
	D18	MA151WK	DIODE, (1/2)
	D19	MA151WK	DIODE, (1/2)
	D20	MA151WK	DIODE, (1/2)
	D21	MA151WK	DIODE, (1/2)
	D22	MA151WK	DIODE, (1/2)
	D23	MA151WK	DIODE, (1/2)
	D24	MA151WK	DIODE, (1/2)
	D25	MA151WK	DIODE, (1/2)
	D26	MA151WK	DIODE, (1/2)
	D31	MA151WA	DIODE, (1/2)
	D32	MA151WA	DIODE, (1/2)
	X1	CSB455EB1T	CERAMIC RESONATOR
	S129	PQ10607-2	SLIDE SWITCH
	TML1	PQ10607-3	BATTERY TERMINAL, (+)
	TML2	PQ10607-4	BATTERY TERMINAL, (-)